HELSINKI SCHOOL OF ECONOMICS (HSE)
Department of Accounting and Finance

DETERMINANTS OF HEDGE FUND ACTIVISM AND SHAREHOLDER GAINS

Finance
Master's thesis
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Spring 2007

Approved by the Council of the Department 29 / 5 2007 and awarded
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ABSTRACT
15.5.2007

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Objectives The objective of this thesis is to i) examine the determinants of hedge fund activism by comparing firms that were targeted by activist hedge funds to those that were not, ii) assess the effects of hedge fund activism on shareholder value, and iii) investigate the sources of shareholder gains from hedge fund activism by analysing a more comprehensive sample from 2000-2006 than concurrent studies by Brav et al. (2006) and Klein and Zur (2006). This thesis extends existing literature by examining the effects of undervaluation on targeting likelihood, cross-sectional variation in CARs over time, and the relations between CARs and target firm characteristics. Overall, this thesis enhances the current understanding of the activist hedge funds' role in the market for corporate control.

Data The core data consist of a unique hand-collected set of 470 activist hedge fund-target firm pairs in 2000-2006 identified using Lexis-Nexis and 13D filings at SEC EDGAR Filing System. The control sample consists of 18,696 listed firm-years that were not targeted. Accounting and return data are from Thomson Worldscope and Thomson Datastream, respectively.

Results Activist hedge funds targets have significantly lower Tobin's q than their industry peers and the likelihood of targeting is significantly higher for such firms. Firms from low q industries are also more likely to be targeted. This evidence supports the view that activist hedge funds target undervalued firms and take actions to enhance firm value. Consistent with the free cash flow theory, targets are also characterised as having high free cash flow, low growth and low insider ownership and such firms are also more likely to be targeted. This evidence supports the view that activist hedge funds can limit agency costs. Targets underperform the market and control firms, but targeting likelihood is not significantly related to pre-targeting stock price performance, indicating that activist hedge funds are not motivated by underperformance per se. In addition, high market capitalisation deters activist hedge funds.

Hedge fund activism creates shareholder value; CAR for a 101-day period surrounding the 13D filing date is 9.23%. CARs have decreased significantly in 2000-2006 and investors tracking activist hedge fund purchases have not been able to make abnormal gains in 2004-2006. CAR is negatively related to pre-targeting performance and positively related to free cash flow. This evidence supports the view that activist hedge funds can discipline underperforming and entrenched managers. CAR is negatively related to Tobin's q supporting the view that markets recognise that activist hedge funds are able to spot undervalued firms. CAR is also negatively related to insider ownership suggesting that insiders deter changes, as well as manage their firms better. Overall, the evidence supports the view that activist hedge funds play an important role in the market for corporate control and increase shareholder value.

Keywords Corporate governance, market for corporate control, hedge fund activism.

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1 Introduction

1.1 Background and motivation

In recent years the market for corporate control in the U.S. has experienced a dramatic increase in shareholder activism by activist hedge funds and old guard corporate raiders such as Carl Icahn and Kirk Kerkorian. In 2006 alone, activist hedge funds targeted 125 U.S. companies with a total market capitalisation of almost $200 billion[1] pushing for changes in corporate policies in an attempt to increase shareholder value. Similar to the hostile raiders of the 1980s, activist hedge funds buy large minority stakes in public companies pressuring managers to change strategies, pay out excess cash, and divest assets. Sometimes they call for the sale of the entire firm, demand leveraged recaps, oppose mergers and acquisitions, and demand resignation of underperforming managers. Activist hedge funds accomplish these objectives by engaging in dialogue with management. At the extreme end, they initiate adverse publicity emphasising weak financial performance and the shortfalls of target firm managers, launch proxy fights for board seats, and even threaten to take over firms that they perceive as destroying shareholder value.

Hedge fund activism has received a great deal of attention in the financial press. Carl Icahn's campaigns to break-up Time-Warner and demand Kerr-McGee to initiate $4 billion share repurchase and asset disposal program, Kirk Kerkorian's efforts to turn around General Motors, and campaigns by lesser-know activist hedge funds including Private Capital Management's push to get Knight-Ridder consider selling itself and SAC Capital Partners' attempt to block the acquisition of Phelps Dodge by Freeport-McRoRan, have all been widely publicised as well as criticised in the business media. Whether hedge fund activism creates value and what motivates hedge funds to engage in activism has been subject to considerable debate. Nevertheless, the market is starting to recognise the increasingly important role hedge funds play in the market for corporate control. In response, the Securities and Exchange Commission (SEC) is currently considering revisiting rules of shareholder access to proxies in alarm that hedge funds might become too powerful. Moreover, activist hedge funds are being

[1] Calculation based on NYSE, AMEX, and NASDAQ listed firms that were subject to 13D filings by activist hedge funds in 2006 and whose market capitalisation was available in Thomson Worldscope. In reality, the number of hedge fund activism events is significantly higher.

characterised as the "new barbarians at the gate" by the financial press analogous to the private equity groups who transformed corporate America in 1980s.

In theory, the market for corporate control moderates the degree to which managers can pursue their own interests at the shareholders' expense. A commonly suggested mechanism to discipline managers who fail to maximise shareholder value is takeovers (Manne 1965, Jensen and Ruback 1983). However, large shareholders can also perform this disciplinary role. This discipline can take several forms, including taking the firm over or threatening to do so, putting it in play, mounting a proxy contest, jawboning, and initiating adverse publicity (Shleifer and Vishny 1986, Butz 1994). Such actions may pressure managers to change firm policies which should, on average, lead to improvements in firm performance and shareholder value.

A great deal of empirical evidence supports the idea that takeovers discipline poorly performing and entrenched managers. The most important point is that takeovers typically increase the combined value of the target and acquiring firms, indicating that profits are expected to increase afterwards (Jensen and Ruback 1983). Takeover targets typically experience below average pre-targeting stock price performance (Palepu 1986, Morck et al. 1989) indicating that their managers are not able to maximise shareholder value. In addition, LBO targets often have high cash flows and low growth opportunities (Lehn and Poulsen 1989, Opler and Titman 1993) indicating that they are suffering from agency problems arising from free cash flow as described in Jensen (1986). Moreover, takeover targets are commonly characterised as having low Tobin's q values (Palepu 1986, Hasbrouck 1985, Servaes 1991, Powell 1997), indicating that they are undervalued. Ang and Chen (2006) further show that takeover targets not just have low Tobin's q but are also undervalued compared to their industry peers.

A significant body of empirical research is also dedicated to examining the role of activist shareholders in the market for corporate control. Holderness and Sheehan (1985) show that block share purchases by corporate raiders in the 1980s were associated with increases in shareholder value. Ikenberry and Lakonishok (1993) and Faleye (2004) show that proxy fights also generate shareholder wealth. However, the fact that shareholder activism by institutional investors such as CalPERS in the 1990s has not improved target firm performance, has raised doubts about the efficacy of large shareholders in disciplining underperforming managers (see, e.g. Karpoff 1998, Gillan and Starks 1998). A plethora of

empirical studies focuses on the type of firms that are targeted by dissident shareholders. Bethel et al. (1998) show that activist investors in the 1980s targeted excessively diversified firms in hope to reap profits by breaking them up. Faleye (2004) shows that proxy contest firms hold too much cash, and concludes that proxy fights can thus reduce the agency problems related to excess cash flow. Furthermore, the targets of activist pension and mutual funds are often poor performers (see, e.g. Smith 1996, Wahal 1996), indicating that active shareholders can discipline poorly performing managers.

Even though other mechanisms in the market for corporate control are extensively studied in economics literature, empirical research on the role of activist hedge funds in disciplining underperforming and entrenched managers is virtually nonexistent. Although today's hedge fund activism bears resemblance to the activity of corporate raiders and private equity groups in the 1980s, as well as to shareholder activism by institutional investors in the 1990s, it is turning out to be quite different from traditional control mechanisms. This thesis along with concurrent work by Brav et al. (2006) and Klein and Zur (2006) are the first attempts to examine the role activist hedge funds play in the market for corporate control.

1.2 Research problem and objectives

The objective of this thesis is to empirically examine 470 activist hedge fund-target firm pairs between 2000 and 2006 to answer the following questions:

1. What types of firms do activist hedge funds target and what motivates hedge funds to engage in activism?;
2. Does hedge fund activism create shareholder value?; and
3. What are the sources of shareholder gains from hedge fund activism?

In an attempt to shed light on the first question, I examine the determinants of hedge fund activism by comparing characteristics of the 470 U.S firms that were targeted by activist hedge funds to 18,696 control firm-years that were not using univariate tests and multivariate logistic regressions. These characteristics are chosen by resorting to underlying theories behind other corporate control events such as hostile takeovers, LBOs, and proxy fights. Specifically, I examine whether target firms show signs of undervaluation, agency problems, and underperformance when compared to control firms and how these affect the likelihood of hedge fund activism. Empirical analysis of target firm characteristics helps to explain why some firms are targeted by activist hedge fund while others are not. I also document

significant heterogeneity across activist hedge fund objectives at target firms. Given this heterogeneity in agendas, I further investigate the extent to which the determinants of activism differ conditioned to type of objectives set forth in the 13D filing.

The second objective is to examine whether hedge fund activism creates shareholder value by analysing CARs surrounding the 13D filing date[2]. If the changes engendered by activist hedge funds increase shareholder value, then hedge fund activist should be associated with significantly positive CARs. In addition, as the number targets and the number of activist hedge funds has increased significantly between 2000 and 2006, I examine the hypothesis that increased competition of fewer attractive targets results to diminishing returns over time. Furthermore, I examine the cross-section of CARs between different hedge fund agendas such as demanding sale of the target or changes in capital structure.

The third objective is to examine the relations between CARs and firm characteristics using multivariate OLS regression analysis. In addition to explaining variation in the likelihood of targeting, firm characteristics should explain the cross-sectional variation in shareholder gains from hedge fund activism. If an important source of shareholder gains from hedge fund activism is the mitigation of agency problems or disciplining underperforming managers, CARs associated with hedge fund activism should be directly related to the severity of agency problems or the magnitude of underperformance. I also examine the effects of targeting year and activism type on CARs in a multivariate setting.

1.3 Contribution and key results

Due to the nascent nature of hedge fund activism, the literature examining this phenomenon is virtually nonexistent. Along with this thesis, concurrent work by Brav et al. (2006) and Klein and Zur (2006) are the first attempts to examine the differences between activist hedge fund targets and nontargets and the shareholder wealth effects associated with hedge fund activism. Brav et al. (2006) compare 374 targets in 2004-2005 to size and market/book matched control firms and find that targets have lower Tobin's q values, have higher cash flows, spend less on R&D, and tend to be smaller than comparable firms. Brav et al. (2006) also show that targets

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[2] The 13D filing date is the first time the markets become aware of the activist hedge funds' efforts. In fact, activist hedge have strong incentives not to announce their agendas before they are required to file the Schedule 13D because that would only exacerbate the free-rider problem of Grossmann and Hart (1980). Therefore, it is plausible to assume that the 13D filing date is indeed the first time the investing public learns about hedge fund activism.

earn a mean CAR of 6.8% during a 41-day period around the 13D filing date. Klein and Zur (2006) add to the literature by examining the determinants of 140 hedge fund activism events in 2003-2005. Using a size and market/book matched control sample, they find that likelihood of hedge fund activism increases with return on assets and cash holdings and decreases with Altman's Z-score. They also show that hedge fund activism is associated with 10.3% geometrically compounded size-adjusted returns during a 61-day period around the 13D filing date[3].

This thesis contributes to existing research in numerous ways. First, it provides a more comprehensive picture on the type of firms that are targeted by activist hedge funds. Most importantly, this thesis extends the work of Brav et al. (2006) and Klein and Zur (2006) by examining the hypothesis that hedge funds target undervalued firms using a novel method introduced in Ang and Chen (2006) who empirically test the stock market driven acquisitions theory of Shleifer and Vishny (2003). Second, this thesis also adds to the understanding of motives behind hedge fund activism as it is the first paper to investigate the effects of undervaluation on targeting likelihood. In addition, this thesis examines the previously unexplored relation between targeting likelihood and variables such as sales growth, market capitalisation, insider and institutional ownership. Third, this is the first paper to examine the cross-sectional variation in returns from hedge fund activism over time covering a period from 2000 to 2006. Fourth, this thesis is the first attempt to examine the relations between CARs and target firm characteristics while controlling for cross-sectional variation in returns over time and between activism types. This analysis sheds additional light on hedge funds motives to engage in activism as well as on the type of firms that are most likely to benefit from hedge fund activism. Finally, compared to concurrent studies, the data used in this thesis cover a longer period of time from 2000 to 2006 and contain about four times as many hedge fund activism events[4]. The remainder of this section discusses these contributions more directly.

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[3] According to Klein and Zur (2006), geometrically compounded size-adjusted return is "the size-adjusted return that an investor would earn by buying and holding the stocks over the holding period". They provide no further elaboration on how these returns are calculated.

[4] The data used in this thesis consist of 470 hedge fund activism events. By comparison, Brav et al. (2006) contain 374 events, but they have all variables available for less than a quarter of target firms. Brav et al. (2006) do not report this number. Klein and Zur (2006)'s sample contains 140 events. Brav et al. (2006) and Klein and Zur's (2006) data include firms that are listed not only on NYSE, NASDAQ and AMEX, but also

The first area of contribution is related to target firm characteristics and how they affect the likelihood of hedge fund activism. Following Ang and Chen (2006) I decompose Tobin's *q* into firm-specific and industry-specific components. The firm-specific component (denoted *abnormal q* in this thesis) is the percentage difference between the firm's Tobin's *q* and the median of its industry peers. Ang and Chen (2006) argue that this is a good measure of misvaluation as it avoids over/undervaluation that affect whole industries and because it has been widely used to proxy market anomalies (see, e.g. Ikenberry et al. 1995, Rau and Vermaelen 1998, and Chen and Jindra 2001). The industry-specific component is simply the median Tobin's *q* of all firms in the target firm's Fama-French 48 industry.

Using the methodology adapted from Ang and Chen (2006), I find that activist hedge fund targets have significantly lower Tobin's *q* values compared to their industry peers (that is, they have lower abnormal *q*) and the likelihood of targeting is significantly higher for such firms. Firms from low *q* industries are also more likely to be targeted. This evidence supports the view that activist hedge funds target undervalued firms and take actions to reverse the undervaluation. This finding contributes to existing research as it shows that undervaluation, as measured by abnormal *q*, is a key determinant of hedge fund activism. Klein and Zur (2006) do not examine the effects of Tobin's *q* on targeting probability because their control group consists of size and market/book matched firms. Moreover, although Brav et al. (2006) find that targets have lower Tobin's *q*, they only perform univariate analysis and are thus not able to draw conclusions about the effects of Tobin's *q* on targeting probability. This evidence is in line with Ang and Chen (2006) and Rhodes-Kropf et al. (2005) who find that firms with low *q* values compared to industry peers are more likely to be subject to cash tender offers.

Consistent with Jensen's (1986) free cash flow theory, targets are also characterised as having high free cash flow, low growth and low insider ownership and such firms are also more likely to be targeted. This evidence supports the view that activist hedge funds are motivated by the potential of limiting agency problems in U.S corporations. This is consistent with Klein and Zur (2006), with the exception that they use return on assets that does not account for the managerial discretion in distributing excess cash to shareholders and do not include proxies for growth opportunities nor insider ownership in their logistic model. This

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on OTC bulletin boards and pink sheets. This thesis only includes target firms listed in major exchanges to avoid the problem that results could be driven by small firms in minor exchanges.

evidence is also consistent with evidence from LBOs (see, e.g. Lehn and Poulsen 1989, Opler and Titman 1993), suggesting that the driving forces behind hedge fund activism and LBOs are, at least to some extent, similar. A major difference, however, is that high insider ownership deters activism, which is consistent with insider ownership deterring changes in corporate control as well as with insiders completing such changes. These results regarding insider ownership are in line with empirical evidence from hostile takeovers (McConnel and Servaes 1991), proxy fights (Faleye 2004) and block share purchases (Bethel et al. 1998).

In contrast to concurrent papers, I show that targets underperform the market and control firms prior to targeting[5], but targeting likelihood is not significantly related to pre-targeting performance indicating that activist hedge funds are not motivated by underperformance per se. This suggests that pre-targeting performance is correlated with undervaluation or agency problems, which appear to play a more important role in target selection. This result is in line with Karpoff et al. (1996) who show that even though firms receiving shareholder proposals underperform the market, pre-targeting performance does not affect targeting likelihood after controlling for other variables. Faleye (2004) examines the determinants of proxy fights in 1988-2000 and reports similar results.

Finally, in line with Brav et al. (2006), I show that activist hedge fund targets are smaller firms compared to control firms when measured with market capitalisation supporting the view that hedge funds are wealth constrained and that 5% stakes in larger targets introduce too much idiosyncratic risk on their portfolios. This thesis contributes to existing literature by showing that high market capitalisation decreases the likelihood of targeting as well. This result is consistent with the evidence that size deters takeovers (Palepu 1986, Ambrose and Megginson 1992).

The second area of contribution relates to shareholder gains from hedge fund activism. In line with concurrent papers, I find that hedge fund activism creates shareholder value; CAR for a 101-day period surrounding the 13D filing date is 9.23%. However, mean CAR is somewhat higher than the 6.8% documented by Brav et al. (2006)[6]. This is because the CARs have decreased significantly between 2000 and 2006. The cumulative abnormal returns over the

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[5] Control sample consists of all NYSE, NASDAQ, and AMEX firms. Both the S&P500 and returns on Fama French 2*3 size and market/book portfolios are used as performance benchmarks. The latter benchmark controls for market/book effects.

[6] When I calculate returns over a 41-day period, CARs of 8.1% is still higher than in Brav et al. (2006).

101-day event window are statistically significantly higher in 2000 (19.27%), 2001 (24.25%), and 2003 (22.83%) than in 2002 (5.80%), 2004 (4.33%), 2005 (7.84%), and 2006 (2.59%). The result is in line with the hypothesis that increased competition of fewer attractive targets and the fact that markets increasingly anticipate hedge fund activism will result in declining returns over time. This is also consistent with the finding of Bradley et al. (2006) that closed-end fund discount shrinks in anticipation of the open-ending attempts from hedge funds. As returns have declined, investors tracking activist hedge fund purchases (that is, buying shares in target companies after the 13D filing date and holding the shares for 50 days) have not been able to make abnormal gains in 2004-2006. In contrast, this strategy has yielded significant abnormal gains in 2000, 2001, and 2003.

The analysis of relations between CARs and firm characteristics is the third area in which this thesis contributes to existing literature. After controlling for cross-sectional variation in returns over time and between activism types[7], I find that CAR is negatively related to pre-targeting performance and positively related to free cash flow. This evidence supports the view that activist hedge funds can discipline underperforming and entrenched managers. The evidence is also in line with Lehn and Poulsen (1989) who find that LBO premium is positively related to free cash flow and Faleye (2004) who shows that CARs associated with proxy fights are positively related to excess cash. CAR is negatively related to Tobin's q supporting the view that markets recognise that activist hedge funds are able to spot undervalued firms. This result is consistent with Lang et al. (1989) and Servaes (1991) who document a negative relation between Tobin's q and gains from takeovers. CAR is also negatively related to insider ownership suggesting that insiders deter changes, as well as manage their firms better as suggested by Dann and DeAngelo (1988), Stulz (1988), and Denis (1990).

1.4 Related research

As mentioned in the previous section, there are two concurrent working papers by Brav et al. (2006) and Klein and Zur (2006) that share similarities with this thesis, but also differ from it in several important areas other than sample size and period covered . The most important difference between this thesis and Brav et al. (2006) is that while the latter paper examines the

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[7] I find significant differences in returns between activism types. See section 5.2.1 for details.

differences between activist hedge fund targets and nontargets using univariate tests only, this thesis uses both univariate tests and multivariate logit analysis. As a result, this thesis provides new evidence not only on the type of firms targeted by activist hedge funds but also on the factors that affect targeting likelihood. In other words, this paper examines which factors are the most important ones in target selection and is therefore able to draw conclusions with regard to the motives of hedge funds to engage in activism. This thesis also adds to the work of Brav et al. (2006) by using a decomposition of Tobin's q into firm and industry specific components. Brav et al. (2006) draw strong conclusions about target "undervaluation" based on the finding that targets have low Tobin's q when compared matched controls although this result may have various alternative interpretations. Targets may just have low growth opportunities or they may come from low q industries, to name a few. Using the firm-specific component, I show that targets have low q values compared to industry peers.

Klein and Zur's (2006) working paper is more similar to this study than Brav et al. (2006) as is it the first attempt to examine the determinants of hedge fund activism using logistic regressions. Compared to this thesis, however, their methodological approach and choice of variables are quite different. Most importantly, their control group consists of an equal number of industry, size, and market/book matched firms, which has several important implications regarding statistical analyses. First, hedge fund activism events are heavily overrepresented in their sample as compared to their true population proportion. If this not specifically accounted for in parameter estimation, the resulting estimates are, according to Palepu (1986), inconsistent and asymptotically biased. I account for this issue by using a control group that consists of all NYSE, NASDAQ, and AMEX listed firms, which makes the proportion of hedge fund activism events extremely close to true population proportion[8].

Second, as Klein and Zur (2006) use size and market/book matched control firms, they are not able to assess the importance of these variables in target selection whereas this thesis is. In fact, as I show, both Tobin's q and size are extremely important determinants of hedge fund activism. I also add several important variables to my logit specification that are not used in Klein and Zur (2006). Using free cash flow as defined in Jansen and Kleimeier (2003) instead

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[8] Discrepancies may arise if the proportion of firms that do not have available data between the hedge fund activism sample and control sample are different.

of return on assets controls for the managerial discretion in distributing cash to shareholders. I also include sales growth as a proxy for growth opportunities. Even though Klein and Zur's (2006) market/book matched control sample partly accounts for the differences in growth opportunities, I show that sales growth enters the logit model with significance even after the inclusion of Tobin's q. Moreover, Klein and Zur's (2006) specification does not include ownership structure variables, which are not only on theoretical grounds but also from an empirical standpoint crucial to understanding the role of activist hedge funds in the market for corporate control. Consequently, I include insider ownership, which proxies for severity of agency problems, and institutional ownership, which proxies for the presence of large shareholders and their role in mitigating the free-rider problem of Grossman and Hart (1980). Both variables appear to be significant in predicting hedge fund activism.

Another important difference between Brav et al. (2006) and Klein and Zur's (2006) papers and the current study relates to the cross-sectional differences in abnormal returns from hedge fund activism. Perhaps due to their short sample periods and smaller samples, neither Brav et al. nor Klein and Zur (2006) examine how CARs from hedge fund activism vary over time. As discussed in the previous section, the returns have decreased significantly over time. Brav et al. (2006) as well as this thesis also analyse the cross-section of returns according to the type of activism and find significant variation in returns. However, unlike concurrent papers, this thesis examines the relations between shareholder gains and firm characteristic while controlling for cross-sectional differences in returns over time and between activism types and finds that firm characteristics have more statistical power in explaining the variation in returns. This suggests that the variation in market reaction to announcement of different types of activism is arises due to the differences in firms attracting different types of proposals.

1.5 Definition of key concepts

This section defines the main terms and concepts used in this thesis. Although hedge fund activism has received a great deal of attention in the financial press, existing academic literature does not provide a clear definition of activist hedge funds or hedge fund activism. This is not surprising given that there is no generally agreed-upon definition of hedge funds themselves. In this thesis, *activist hedge funds* are hedge funds who announce their intention of influencing firm policies or who are known for activist policies in the past. This group also includes a number of well-known "raiders" such as Carl Icahn and Kirk Kerkorian but does not include pension or mutual funds, such as CalPERS, that are also known for activist

policies. Mutual and pension funds are excluded because their organisational structure, motives, and incentives to engage in activism differ markedly from those of hedge funds.

I define *hedge fund activism* as an event where an activist hedge fund acquires at least 5% of a firm's outstanding equity with the intention of influencing firm policies. More specifically, Section 13D of the Exchange Act of 1934, passed by U.S. Congress to regulate the method and timing of tender offers, requires anyone who acquires more than 5% of a public company's outstanding shares with the intention of influencing firm policies[9] to file a Schedule 13D, a disclosure document, with the SEC within ten days of surpassing the 5% ownership threshold. Among other items, this filing includes the name and background of each acquiring individual or of any individuals who control the acquiring corporations. Therefore, hedge fund activism is when an activist hedge fund acquires at least 5% of a firm's outstanding equity and subsequently files a Schedule 13D with the SEC. Activist hedge fund targets are naturally the firms that are subject to the 13D filings. The term *activist hedge fund-target firm pair* refers to a specific activist hedge fund that is matched to a target firm based on the 13D filing by that fund. However, a severe drawback of this definition is that it precludes cases where the activist hedge fund stake remains below the 5% threshold. For example, Pershing Square Capital Management's efforts to force McDonald's Corporation to restructure its business and sell 65% of its restaurants in 2005 would have been excluded from the sample as Pershing's stake remained below the 5% threshold at 4.5%.

One of the key hypotheses examined in this thesis is the undervaluation hypothesis. This thesis defines *undervaluation* as relative undervaluation and measures it by comparing Tobin's q values of target firms to the median Tobin's q of their Fama-French 48 industry peers. This method uses the product of the individual firm's book value and its industry median market/book value as the measure of the firm's *fair value*. Consequently, firms with lower Tobin's q than their industry peers are considered as being undervalued and can be considered as "cheap buys". The relative undervaluation comparison removes the effects that

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[9] In particular, these include events that would result in: a) the acquisition of additional securities or disposal of securities of the issuer; b) a merger, reorganization, liquidation involving the issuer or any of its subsidiaries; c) material disposals of issuer's assets; d) change in present board of directors or management; e) change in capitalisation or dividend policy; f) any other material change in the issuer's business or corporate structure; g) changes in the firm's charter or bylaws; h) delisting of issuer's shares; i) any class of equity security eligible for termination of registration; or j) any action similar to any of those enumerated above.

are time period or industry specific, and thus helps to put the magnitude of undervaluation in perspective.

1.6 Structure of the study

The remainder of this thesis is organised as follows. Section 2 provides a review of the most relevant theoretical and empirical research on the topic. Section 3 presents the hypotheses and Section 4 discusses the data. Section 5 presents the empirical results. Finally, Section 6 reviews central findings and concludes.

2 Literature review

This section reviews the most relevant theoretical and empirical research in the area of hedge fund activism. Section 2.1 briefly describes the unique characteristics of hedge funds. Section 2.2 reviews the theoretical literature on large shareholders' role in the market for corporate control. Section 2.3 discusses various theories that can be used to explain motives behind hedge fund activism and corresponding empirical evidence. Finally, Section 2.4 presents competing views about the effects of hedge fund activism on shareholder value and discusses related empirical findings.

2.1 Hedge funds

Hedge funds have been in existence for over 50 years. However, their recent growth has increased their prominence in all corners of capital markets and in the financial press. Since the beginning of 1990s, the number of hedge funds has risen by 20 percent per year. The rate of growth has been even more dramatic in assets under hedge funds' management. In 1990 slightly more than 500 hedge funds managed less than $40 billion in assets. In the end of 2004, there were more than 5000 hedge funds managing a total of nearly $900 billion[10] implying and average size of $160 million. Though the number and size of hedge funds are small relative to mutual funds, their growth reflects their increasing power in the capital markets. The increased competition between hedge funds has driven down returns on traditional hedge fund strategies such as convertible arbitrage and some hedge funds are looking to shareholder activism as an additional strategy.

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[10] Statistics on hedge fund growth appear in the HFR Industry Report – Year End 2004, produced by Hedge Fund Research, Inc.

Ackermann et al. (1999) outline five features that generally characterise hedge funds. These features include i) a largely unregulated organisation structure, ii) flexible investment strategies, iii) relatively sophisticated investors, iv) substantial managerial investment, and v) strong managerial incentives, and are briefly described in the following two paragraphs.

According to Ackermann et al. (1999), U.S. hedge funds are largely unregulated because they are typically limited partnerships with fewer than 100 investors who are institutions or very high net worth individuals, which exempt them from the Investment Company Act of 1940. The limited regulations that can be applied to hedge funds allow them to be extremely flexible in their investment strategies. Hedge funds can use short selling, high leverage, derivatives, and highly concentrated investment positions to enhance returns and reduce systematic risk. Ackermann et al. (1999) note that hedge funds attract mainly institutional investors and wealthy individuals, with minimum investments typically ranging from $250,000 to $1 million. Additionally, hedge funds often limit an investors' liquidity with lock-up periods of one to three years. This allows hedge funds to tap more illiquid market than traditional mutual funds.

Hedge funds are also characterised by strong performance related incentives. Ackermann et al. (1999) show that, on average, hedge fund manager receives a one percent annual management fee and 14 percent of the annual profits. Although incentive fees could lead to excessive risk taking under some conditions, the fact that hedge fund managers often invest a substantial amount of their own money in the fund mitigates these problems. Furthermore, Ackermann et al. (1999) note that managers of U.S. hedge funds are general partners, so they may incur substantial legal liability if the fund goes bankrupt. As pointed out by Ackermann et al. (1999), the structure and characteristics of hedge funds closely resembles that of venture capital and private equity funds that tend to be limited partnerships with strong incentive fees. In this sense, it is not surprising to observe that activist hedge funds are increasingly behaving like private equity firms, but in the public markets.

2.2 Large shareholders and the market for corporate control

2.2.1 The market for corporate control

The separation of ownership and control documented by Berle and Means (1932) creates substantial conflicts of interests, or agency problems, between managers and shareholders. Agency theory, analysis of such conflicts, is now a major part of the economics literature.

Economists have identified numerous ways in which managers may engage in non-value maximising behaviour. For example, it can include insufficient effort (Jensen and Meckling 1976), sheer incompetence (Jensen 1988), excessive growth or diversification (Jensen 1986), entrenching investments (Shleifer and Vishny 1989), consumption of excessive perks (Jensen and Meckling 1976), or outright illegal activities such as thievery (Shleifer and Vishny 1997). There is a considerable amount of theoretical and empirical evidence of agency costs and the prevalence of non-value maximising or even value destructive managerial behaviour that does not serve the interests of shareholders (see, e.g. Shleifer and Vishny 1997).

The range of non-value maximising behaviour on the part of managers is wide and can be very expensive to shareholders. It ensues that reducing the possibility of managers to engage in such behaviour can have substantial positive effects on firm value. Economists have identified various mechanisms that alleviate insider moral hazard and help align managers' interests with those of shareholders. These can be divided into internal and external control mechanisms. Internal mechanisms include managerial incentives (Jensen and Murphy 1990), bonding activities (Jensen and Meckling 1976), monitoring by the board of directors (Fama and Jensen, 1983), and product-market competition (Hart 1983).

However, these internal mechanisms often fail, or they are too slow, costly and clumsy to bring about the required changes. To begin with, Jensen and Murphy (1990) show there is an insufficient link between executive pay and performance. In addition, Jensen (1993) shows that management is often reluctant to assume debt so as to bond their promise to pay out free cash flow. Moreover, Morck et al. (1989) show that the board is only partly effective in disciplining poorly performing managers. Furthermore, Shleifer and Vishny (1997) argue that the effects of product-market competition on management behaviour materialise painfully slow as illustrated by the crisis of the U.S. automobile manufacturing industry. Finally, Jensen (1986) argues product-market competition is markedly weaker in new activities which generate substantial free cash flow. In such instances where the internal controls fail, investors rely on external control mechanisms - that is, the market for corporate control - to redirect management toward value maximising behaviour or otherwise replace the incumbent management team.

The market for corporate control moderates the degree to which managers can pursue their own interests at the shareholders' expense. A commonly suggested mechanism to discipline managers who fail to maximise shareholder value is takeovers (Manne 1965, Jensen and

Ruback 1983). However, Shleifer and Vishny (1986) argue that large shareholders can also perform this disciplinary role. Next section will discuss large shareholder's disciplinary role more thoroughly by reviewing the most important theoretical work related to the topic.

2.2.2 Motivation for shareholder activism

Before analysing the incentives of large shareholder to monitor managers and engage in activism, it is useful to distinguish between three choices they face when they are not satisfied with managerial performance. First, they can "vote with their feet" and follow the so called "Wall Street Walk" and sell their shares. Second, they can hold on to their shares and do nothing. Third, they can hold their shares and voice their dissatisfaction, that is, engage in shareholder activism. The generic distinction between these alternatives: exit, loyalty, and voice, was first introduces by Hirschman (1970). However, Tirole (2006) point out that there is also a fourth alternative: entry, which may be desirable because the incumbent shareholder may be ineffective or in the case where the entrant has obtained favourable information that the target company is, for example, undervalued. Not surprisingly, rational shareholders will become "active" (voice or entry) if the expected benefits exceed the expected costs of activism.

Economists widely agree that the involvement of large shareholders in monitoring and shareholder activism has the potential to limit nonvalue maximising behaviour on the part of managers and create shareholder value. However, shareholder activism is costly, undermining large shareholders' incentives engage in such activity. Shleifer and Vishny (1986) is the first paper to formally address large shareholders' role in disciplining managers through takeovers, proxy fights and informal negotiations with managers ("jawboning"). They argue due to the free-rider problem described in Grossman and Hart (1980) there will be too little monitoring and that potential monitors with small initial holdings never find it profitable to intervene with management. Furthermore, they argue that these impediments make a large shareholder a necessary condition for value-increasing takeovers to occur at all as they make takeovers less costly and more likely to be successful. As subsequent theoretical research shows, these arguments do not always hold. Butz (1994) shows that merely threatening to take over or initiating adverse publicity, large shareholder can pressure managers to adopt value increasing policies. In order to keep their positions, managers have an incentive to adopt a fraction of the improvements that pre-empts the takeover.

Furthermore, in contrast to Shleifer and Vishny (1986), Admati et al. (1994) show that even investors with zero initial holdings have an incentive to increase their stake and engage in monitoring activities. Admati et al. (1994) also point out that large shareholders can obtain private information as a by-product of monitoring and realise trading gains that partially offset the costs associated with the free-rider problem. Similarly, Kyle and Vila (1991) show that corporate raiders lacking any initial stake find it profitable to take over in spite of the free-rider problem and the lack of presence of large shareholder due to "noise trading". Maug (1998) also analyses the effect of liquidity on large shareholder incentives to intervene and posits that higher liquidity mitigates the free-rider problem since large shareholders can accumulate larger stakes without a significant price impact. In addition, he shows that the more liquid market, the more effective methods such as restructurings are used to correct managerial failure. However, Kahn and Winton (1998) point out that market liquidity can also undermine large shareholders' incentives to monitor by giving them incentives to trade on private information rather than intervene. Finally, Noe (1997) shows that there is not monotonic relationship between the size of the shareholder and incentives to monitor. In fact, Noe (1997) suggests that among those investors who choose activism those with the smallest holding are the most aggressive.

Not all economists consider activism by large shareholders as purely beneficial. One example is Bukart et al. (1997) arguing that constraints on managers through monitoring may also be costly precisely because managerial discretion comes with many benefits. Specifically, even if managerial discretion is ex post detrimental to shareholders, it can be beneficial ex ante as it favours noncontractible investments, like searching for new investment projects. Bukart et al. (1997) posit that managers are less inclined to show such initiative when shareholders are likely to intervene. Hence, to the extent that managerial initiative contributes to firm value, there is a trade-off between the gains from monitoring and those from managerial initiative.

2.2.3 Limits of shareholder activism

For all its benefits, shareholder activism encounters a number of limitations that make monitoring less effective or undermine the large shareholder's incentives to engage in activism. Tirole (2006) provides an excellent review of the literature that relates to these limitations and groups them into four categories that are outline below. However, the unique organisational structure of hedge funds at least partly mitigates these issues.

Agency problems

First, activist investors face substantial agency problems themselves. As pointed out by Tirole (2006), institutional investors such as pension and mutual funds have a dispersed ownership structure with no large shareholders wielding control over management. The negative effects are augmented by the fact that there are very few mechanisms that mitigate agency problems within the funds themselves (Coffee 1991). Indeed, the Investment Company Act of 1940 imposed restrictions on mutual fund fees that resulted in a compensation structure where fees are based on assets under management rather than investment performance decreasing fund manager's incentives to act in the best interest of their shareholders or beneficiaries. Coffee (1991) also notes that most U.S. money managers have no debt and face no threat of hostile takeovers or proxy fights and therefore face less pressure to comply with shareholder value maximising policies.

As pointed out in Section 2.1., the organisational structure of hedge funds is markedly different from that of traditional institutional investors. For example, hedge funds are not only exempt from the restrictions of the Investment Company Act of 1940, but also have compensation structures that are more sensitive to actual performance. Hedge fund managers' incentives are further strengthened by the fact that they typically retain large stake in the funds they manage. This greatly reduces the potential for agency problems within hedge funds.

Undermonitoring, collusion and private benefits of control

Tirole (2006) suggests that because active investors do not internalise the welfare of other investors, their incentives to monitor managers may be distinctly weaker. This obviously results in less than the first-best level of monitoring. Tirole (2006) also suggests that it may give rise to collusion with management. For example, mutual fund managers have an incentive to support management as they might seek to manage their pensions. Additionally, Tirole (2006) points out that large shareholders may extract private benefits of control through affiliated transactions such as selling assets to companies they own at below market prices.

Cost of providing incentives

According to Tirole (2006), the third set of limitations relate to the costs of providing proper incentives to monitor managers. Coffee (1991) and Bhide (1993) argue that only "long-term

players" are good monitors. The basic idea in these studies is that investors have little incentive to engage in activism if they can easily sell their shares at a fair price. This cut-and-run behaviour has been labelled by economists and finance practitioners as the "Wall Street Walk". These authors further argue that illiquidity in the form of privately held equity, capital gains tax, and letter stocks would enhance the quality of monitoring, but consider it as extremely costly from the perspective of mutual funds that face continuous redemptions. Because hedge funds often limit an investors' liquidity with lock-up periods of one to three years they obviously have greater incentives to monitor firm performance.

Regulatory obstacles

Fourth, would-be activist investors face substantial legal and regulatory obstacles that discourage them from activism. Roe (1991), Coffee (1991), and Bhide (1993) offer various examples of legal, fiscal, and regulatory impediments to investors that discourage efficient governance in the form of shareholder activism. For example, large investors who are deemed to be in "control" face severe trading restrictions; Section 16(b) of the Securities Exchange Act of 1934 stipulates that any gain that an officer, director, or 10% holder of a security receives on purchases or sales of the security within six months or an earlier purchase or sale must be paid back to the company. Tirole (2006) argues that these restrictions create illiquidity and are especially costly for mutual funds that face redemptions on a continuous basis and must therefore be able to sell easily. Another potential source of discouragement presented in Tirole (2006) is the diversification rule. In order to receive favourable tax treatment as a diversified fund, pension or mutual fund cannot hold more than 10% of any firm's equity nor can 5% of the fund's assets be invested in any one security. Again, hedge funds are largely exempt from these regulations. They face no diversification rules and can therefore hold large positions in any firms without considerable tax consequences.

2.3 Determinants of hedge fund activism

As discussed in Section 2.2, rational shareholder will become active is the expected benefits exceed the expected costs of activism. This section describes most prominent theories that explain why activist hedge funds are more likely to target some firms and not others and why such events are likely to create shareholder value. A bulk of these theories comes from the takeover literature but they can also be used to develop hypotheses about which firms are more likely to be targeted by activist hedge funds.

2.3.1 Undervaluation

Activist hedge funds commonly cite that target undervaluation is a key motive driving their investment decisions. This explanation of hedge fund activism also appears frequently in the financial press. However, theoretical foundations for the *undervaluation hypothesis* are not as strong as it is empirically difficult to tell apart between undervaluation and other motives for taking over companies such as underperformance. However, economists frequently argue that undervaluation is an important motive for taking over companies (see, e.g. Palepu 1986, Holderness and Sheehan 1985, Powell 1997).

The superior security analysis hypothesis presented by Holderness and Sheehan (1985) suggests that corporate raiders in the 1980s were systematically able to purchase undervalued stock. Holderness and Sheehan argue that these stock purchases can be based on either non-public information about target firms possessed by the raiders or on superior analysis skills that raiders have in interpreting publicly available information about target firms. This hypothesis is consistent with the theoretical analysis of Admati et al. (1994) who suggest that large shareholder who closely monitor firm performance are able to obtain private information as a by-product of monitoring and make trading gains on such information. If the markets are aware that some type of investors can exploit private information, then this hypothesis should also explain why the market prices increase upon announcement of block purchases.

Empirical research into the link between undervaluation and the likelihood of corporate control events suffers greatly from alternative interpretations of variables that have been used to measure undervaluation. For example, Palepu (1986), Hasbrouck (1985), and Powell (1997) use Tobin's q as a measure of undervaluation. On the other hand, Opler and Titman (1993) and others use Tobin's q as a measure of growth opportunities. Third, Lang and Stulz, (1994) and Servaes (1991) use Tobin's q as a proxy for managerial performance. All of the above mentioned studies find a negative relation between takeover probability and Tobin's q, but differ greatly in their conclusions.

A partial solution to his problem can be found in Ang and Chen (2006) who decompose Tobin's q into firm-specific and industry-specific components. The purpose of Ang and Chen's (2006) paper is to empirically test the stock market driven acquisitions theory of Shleifer and Vishny (2003) according to which managers are able to spot valuation errors in their company's as well as potential target's share price and exploit this information by

undertaking acquisitions of relatively (absolutely) undervalued firms using stock (cash). Using the firm-specific component, Ang and Chen (2006) can make interpretations about target undervaluation that are not so easily mixed with alternative explanations and mitigate the "high water raises all boats" phenomenon because the firm-specific component is clean from industry-wide valuation errors. Using this methodology, Ang and Chen (2006) find that acquisition targets are significantly undervalued compared to their industry peers when cash is used as a method of payments. Rhodes-Kropf et al. (2005) perform similar analysis and find comparable results.

With regard to hedge fund activism, Brav et al. (2006) find that target firms have lower Tobin's q values than industry and size matched controls. They do not examine whether Tobin's q affects targeting likelihood but suggest that this indicates that activist hedge funds seek undervalued targets. Klein and Zur (2006) do not test differences in Tobin's q as their control group consists of market/book matched firms.

2.3.2 Pre-targeting performance

A substantial amount of academic literature in the area of market for corporate control notes the importance of target share price performance in predicting corporate control contests, such as takeovers, proxy fights, and shareholder activism. Theoretical foundations for this *inefficient management hypothesis* are laid out in Manne (1965). A wide body of empirical research supports the premise that poor stock price performance increases the likelihood of corporate control contests and replacement of inefficient managers.

The initial theoretical work that recognised the role of takeovers and proxy fights in disciplining poorly performing managers is Manne (1965). He argues that the market for corporate control mitigates problems arising from the separation of ownership and control documented by Berle and Means (1932). A fundamental premise behind Manne's (1965) argument is the existence of a high positive correlation between managerial efficiency and the share price performance of that firm. Therefore, if a firm is suffering from severe agency problems or is just poorly managed, then the market price of the firm's shares will decline relative to other companies in the same industry or relative to the market as a whole. According to Manne (1965), this phenomenon has a dual importance for the market for corporate control. In the first place, low share price facilitates competition of managerial positions. More importantly, low share price does not just measure managerial efficiency, but also potential gains that could be realised under efficient management. Thus, Manne (1965)

concludes that the lower the share price, relative to what it could be under more efficient management, the more attractive takeover becomes to those who believe that they can manage the firm more efficiently.

Palepu (1986) is on of the first papers that documents an inverse relation between takeover probability and share price performance. Palepu (1986) measures performance using both excess returns and return on equity averaged over a period of four years prior to the takeover bid. He further notes that excess returns is probably a better proxy for performance as it measures both current and expected performance. Morck et al. (1989) confirm Palepu's (1986) results and find that the likelihood of hostile takeovers decreases with share price performance. Furthermore, they identify separate firm-specific and industry-specific effects indicating that while board of directors is effective is disciplining managers of firms that clearly underperform their industry, only hostile takeovers do the job when the firm, and its industry, are suffering from underperformance. In addition, Martin and McConnel (1991) show that firms experiencing post-acquisition top management changes experience significantly lower pre-acquisition returns than firms where no management changes took place. These findings indicate that the takeover market plays an important role in controlling nonvalue maximising behaviour on the part of managers.

While economists examining proxy fight targets widely agree on the fact that target firms experience below average accounting performance prior to targeting (see, e.g. DeAngelo 1988, Ikenberry and Lakonishok 1993, Faleye 2004), the evidence on prior share price performance is somewhat mixed. DeAngelo (1988) finds no link between stock price performance and the occurrence of proxy fights, which they attribute to the fact that dissident shareholder typically cite poor earnings rather than poor share price performance as necessitating the proposed hostile management change. However, a later study by Ikenberry and Lakonishok (1993) contradicts DeAngelo's results (1988) and finds that proxy fight targets significantly underperform the market prior to proxy contest. However, Faleye (2004) finds that even though proxy contest firms underperform the market prior to targeting, the effects of share price performance on targeting probability do not endure in a multivariate setting.

A substantial body of empirical literature examines firm characteristics associated with shareholder activism by institutional investors. Opler and Sokobin (1997), Strickland et al. (1996), and Wahal (1996) show that negative returns prior to targeting increase the

probability of institutional investor activism. On the contrary, Bizjak and Marquette (1998), Carleton et al (1998), and Smith (1996) find that prior stock price performance in not significantly related to targeting. Furthermore, Karpoff et al. (1996) show that the effects of prior returns on targeting probability become insignificant after controlling for other firm characteristics. Empirical evidence on accounting measures of performance is more conclusive. Opler and Sokobin (1997), Wahal (1996), and Karpoff et al. (1996) all find that low return on assets is associated with increased targeting probability.

In addition to this thesis, two concurrent working papers by Brav et al. (2006) and Klein and Zur (2006) analyse the characteristics of firms that are targeted by activist hedge funds. Brav et al. (2006), analysing a sample of 374 13D filings by activist hedge funds in 2004-2005, find that there are no differences between prior share price performance of activist hedge fund targets and size and market/book matched control firms. They do not examine determinants of hedge fund activism in a multivariate setting as they have data only for one third of their sample. Similarly, examining 140 13D filings in 2003-2005, Klein and Zur (2006) find no differences in prior performance between activist hedge fund targets and size and market/book matched control firms. However, they do find that activist hedge fund targets perform significantly better than other firms that were subject to 13D filings. In conclusion, the empirical evidence on share price performance and occurrence of hedge fund activism is somewhat mixed and suffers from the fact that earlier studies use small samples from short periods of time accompanied by different control samples and methodologies in performance measurement. However, existing empirical evidence suggests that activist hedge fund targets do not experience underperformance prior to targeting.

2.3.3 Free cash flow

Jensen's (1986) free cash flow theory is one of the most prominent theories that explain why firms with substantial cash flow are likely to destroy shareholder and how takeovers can mitigate these agency problems. Empirical evidence from takeovers, LBOs, and proxy fights has found compelling evidence in support the *free cash flow hypothesis* of takeovers.

Jensen (1986) lays out the agency issues raised by free cash flow and excess liquidity. As argued by Jensen, payout of free cash flow creates major conflicts between managers and shareholders and defines free cash flow as cash flow in excess of what is needed to finance all positive net present value projects. By definition, such cash should be paid out to the firm's shareholders since the corporation cannot invest it profitably on its behalf. However, payouts

to shareholders reduce the resources under managers' control, restricts their ability to pursue growth, and increases monitoring from capital markets. Additionally, managers have incentives to grow their firms beyond the size that maximises shareholder value because growth increases managers' power and compensation. Moreover, the tendency of firms to reward middle managers through promotion rather than year-to-year bonuses also creates an organisational bias toward growth to supply the new positions that such promotion-based reward systems require. Jensen's (1986) free cash flow theory explains why managers may engage in pet projects, build empires, make dubious acquisitions, and diversify their firms excessively when the investment opportunities in their traditional business are low to the detriment of shareholders. According to Jensen (1986), agency problems associated with free cash flow are especially severe in firms with substantial free cash flow and low growth prospects since such firms may suffer from a shortage on positive NPV projects.

Jensen and Meckling (1976) suggest that management can engage in bonding activities that eliminate or reduce the potential for agency problems. In the context of excess free cash flow, debt creation without the retention of proceeds enables managers to effectively bond their promise to payout future cash flows. Such activities include substituting debt and other fixed claims for common equity (Masulis 1980, Copeland and Lee 1991), increasing payout to shareholder through a stock repurchase or special dividends (Vermaelen 1981, Nohel and Tarhan 1998), or taking the firm private in a leveraged buyout (Lehn and Puolsen 1989, Opler and Titman 1993). The abnormal returns accompanying these transactions suggest that investors recognise the potential for agency problems in the utilisation of cash and reward firms whose managers take suitable actions to minimise such problems. Yet, Jensen (1993) shows that management is often reluctant to make appropriate changes and do not opt for a value maximising leverage level.

Jensen (1986) argues that the free cash flow theory predicts value increasing takeovers occur in response to breakdowns of internal control processes in firms with substantial free cash flow. Several empirical studies provide support for Jensen's (1986) theory. Lehn and Poulsen (1989) show that LBO probability and associated premiums increase with free cash flow. Palepu (1986) finds that takeover probability increases with the combination of low growth, high cash holdings, and low leverage. Opler and Titman (1993) support Palepu's (1986) findings by showing that firms with high free cash flow and low Tobin's q are more likely to go private in an LBO. However, some contradicting evidence can be found from research on hostile takeovers. For example, Pinkowitz (2002) finds that takeover likelihood decreases

with cash holdings. Specifically, Pinkowitz (2002) finds that firms that were not targeted hold 40% more cash than those that were, and the likelihood of receiving hostile bids decreases significantly with cash holding. In an earlier paper, Harford (1999) documents a similar relation between cash holdings and hostile bids. Both Pinkowitz (2002) and Harford (1999) also find that hostile takeover likelihood is decreasing in leverage.

Faleye (2004) analyses the free cash flow hypothesis in the context of proxy fights and outlines several reasons why takeovers might fail to discipline firms with excess cash. Substantial cash holdings provide firms with many anti-takeover defences. They can make share repurchases, which can concentrate voting power in the hands of insiders (Harris and Ravis 1988, Stulz 1988) and may increase the costs of a takeover (Bagwell 1991). Cash rich firms can also defend themselves by acquiring a competitor of the bidder or by making a counter bid for the unwanted bidder (Dann and DeAngelo 1988). Furthermore, Faleye (2004) suggests the proxy contest as an effective alternative to takeovers for addressing the agency costs arising from free cash flow. He argues that the extra defences a cash rich firm may use against a hostile bidder are largely ineffective against dissident shareholders. For example, it is obvious that share repurchases cannot discourage a plain proxy fight intended to force managers to disgorge excess cash. In the empirical part of his paper, Faleye (2004) finds support for this theory by showing that proxy fight targets hold significantly more cash even after controlling for growth opportunities, riskiness of cash flow, and other determinants of corporate cash holdings. Faleye (2004) also shows that probability of proxy contests is significantly increasing in cash holdings.

Existing empirical research into characteristics of firms that attract shareholder proposals from active institutional investors provides generally no support for Jensen's free cash flow theory. Opler and Sokobin (1997), Wahal (1996), and Karpoff et al. (1996) all find that low return on assets is associated with increased targeting probability. However, Strickland et al. (1996) report that return on assets has no effect on targeting probability, but this result can probably be attributed to the fact that they study United Shareholder Association's targets only. However, Karpoff et al. (1996), Johnson and Shackell (1997), and Bizjak and Marquette (1998), all find that growth in sales is negatively related to shareholder activism, suggesting that shareholder activism targets are more susceptible to agency problems even though they do not appear to generate substantial free cash flow.

Examining the characteristics of activist hedge fund targets, Brav et al. (2006) find that they have significantly higher cash flows than size and market/book matched control firms. However, target firms do not appear to possess lower growth prospects as there are no differences in sales growth between them and control firms. This may simply be a market/book effect as their choice of control group implicitly controls for cross-sectional variation in market/book. Brav et al. (2006) find that target firms hold significantly less cash and significantly more debt than control firms. In another paper, Klein and Zur (2006) find no differences in profitability between targets and size and market/book matched control firms. However, in their multivariate analysis, Klein and Zur find that firms with high return on assets are more likely to be targeted by activist hedge funds. They also find that cash holdings are positively related to targeting probability. Overall, these results lead the authors to assert that rather than targeting poor performers, activist hedge funds target firms with ample cash flows and high potential for agency problems

2.3.4 Diversification

One specific cause of poor performance, especially in the 1980s, appears to have been excessive diversification. Theoretical work by Jensen (1986) and Shleifer and Vishny (1989) present arguments that managers have incentives to excessively diversify their firms to the detriment of shareholders. Several pieces of empirical literature show that diversification does destroy shareholder value. One implication of *diversification discount hypothesis* is that bidders in takeovers and dissident shareholders have an opportunity to improve performance and create shareholder value by increasing focus.

Shleifer and Vishny (1989) argue that substantial agency costs arise from the fact that managers can expropriate shareholders by entrenching themselves and staying on the job even if they are no longer competent or qualified to run the firm. One specific way managers can reduce the probability of replacement is through diversifying acquisitions. Moreover, they may overpay for their targets because they can extract more private benefits including salary and perquisites through increased entrenchment. This result is especially true for poorly performing managers who are most threatened by replacement. One of the most important predictions of Shleifer and Vishny (1989) theory is that bust-up takeovers should be associated with increased shareholder value.

Jensen's (1986) free cash flow theory also explains why managers may seek to diversify their firms excessively. As explained earlier, firms facing limited growth opportunities and

substantial free cash flow are more likely to engage in diversifying acquisitions as growth prospects in their traditional business are low. Even though these investments are not value decreasing per se, they would be more valuable under different management.

The value destruction associated with diversification generates large profit opportunities for outsiders who are able to increase corporate focus. For example, potential acquirers have an incentive to take over excessively diversified companies and break them up. Additionally, dissident shareholder can pressure managers to do the breaking-up themselves. Consistent with diversification discount hypothesis of takeovers, Berger and Ofek (1996) find that greater value losses from diversification are associated with increased takeover probability, even after controlling for other determinants of takeovers. Furthermore, they find that when the acquirer is an LBO association, the value losses are significantly greater. Berger and Ofek (1996) also show that the greater the value loss associated with diversification, the greater the probability of a subsequent break-up. Overall, their results are consistent with the market for corporate control targeting and breaking-up firms that would be more valuable on a stand-alone basis.

Consistent with the hypothesis that dissident shareholder can also mitigate problems arising from excessive diversification, Bethel et al. (1998) find that activist investors in the 1980s were significantly more likely to purchase blocks of shares in highly diversified firms with poor profitability. These block purchases were followed by increases in assets divestitures and abnormal share price appreciation. Their evidence supports the view that in addition to takeovers, activist shareholders can alleviate problems associated with agency problems and excessive diversification.

With regard to hedge fund activism, Brav et al. (2006) find evidence that target firms are excessively diversified. Specifically, they compute the Herfindahl-Hirschman index of sales in different business segments and find that target firms are more diversified than size and market/book matched control firms. However, as they do not perform logistic analysis, Brav et al. (2006) do not draw conclusions about the importance of diversification in the target selection process.

2.3.5 Ownership structure

Ownership structure has been shown to affect the probability of takeovers, proxy fights, and shareholder activism. There are various theories that explain why the likelihood of corporate

control contests should decrease with insider ownership (Jensen and Meckling 1976, Stulz 1988). On the other hand, the presence of large outside block holders can increase this probability (Shleifer and Vishny 1986).

Insider ownership

Jensen and Meckling (1976) formally model the relation between insider ownership and firm value. They divide shareholder into two groups – insiders who manage the firm and have exclusive voting rights and outsiders who do not. Both insiders and outsiders have equal right to dividends per shares held. However, the insider can obtain private benefits by consuming excessive perks, such as corporate jets, and engage in other nonvalue maximising strategies that benefit him but reduce cash flows to outside shareholder. Thus, the value of firm depends on the fraction of share held by insiders and the greater such fraction, the greater the value of the firm. McConnel and Servaes (1990) confirm this by documenting a curvilinear relation between Tobin's q and insider ownership. Their empirical analysis shows that the curve slopes upward until insider ownership reaches 40-50% and then sloes slightly downwards.

Stulz (1988) focuses on the importance of the market for corporate control for disciplining corporate managers. In his theoretical model, the premium that a hostile bidder must pay to gain control of the target firm increases with the fraction of shares held by management, but the probability of success of the takeover decreases. At low levels of insider ownership, increased equity holdings better align the interests with outside shareholders, enhancing firm value. At higher levels of insider ownership, managerial entrenchment blocks takeovers and makes them more costly. As a result, Stulz (1988) predicts that takeover probability decreases with insider ownership, which is likely to decrease the value of the firm. For example, at 50% insider ownership, the probability of hostile takeovers decreases to zero because the incumbents can block the takeover by just voting no. Stulz's (1988) analysis also applies in the context of hedge fund activism. To get their proposals implemented dissident shareholders must pressure managers or launch a proxy fight in order to get firms to adopt proposed changes. Indeed, if managers control over 50% of the voting power, dissidents are almost guaranteed to fail and no proxy fights would occur.

Empirical evidence on takeovers, proxy fights and shareholder activism suggests that insider ownership does deter corporate control contests. For example, McConnel and Servaes (1990), Song and Walkling (1993), and Shivdasani (1993) all find that managerial ownership is negatively related to takeover attempts. However, in a paper examining the determinants of

LBOs, Weir et al. (2005) find that the relation between LBO probability and insider ownership is positive, which is probably due to the fact that incumbent managers play a key role in the LBO process.

The deterrence effect of insider ownership has also been documented in the proxy fight literature. Faleye (2004) finds that firms with high insider ownership are significantly less likely to become targets in proxy contests. Similarly, Bethel et al. (1998) examine activist block purchases in the 1980s and find an inverse relation between probability of activist block purchases and a dummy variable that equals one if managers own more than 5% of equity. Additionally, empirical studies on shareholder activism by institutional investors show that target firms have lower insider ownership (see, e.g. Smith 1996, Karpoff et al. 1996, Strickland et al. 1996). Interestingly, Smith (1996) and Karpoff et al. (1996) fail to find significance for the relation between insider ownership and the likelihood of targeting in logistic regression indicating that it does not affect targeting probability. However, Strickland et al. (1996) show that insider ownership significantly decreases targeting probability, but this finding can probably be attributed to the fact that they study targets of United Shareholders Association only. There is no existing evidence with respect to hedge fund activism and insider ownership.

Institutional ownership

In contrast to the deterrence effect of insider ownership, the presence of a large outside shareholder can increase the likelihood that a firm is targeted. Shleifer and Vishny (1986) formulate a model in which the presence of a large minority shareholder who does not take part in the management of the firm provides a partial solution to the free-rider problem of Grossman and Hart (1980). They show that the probability of takeovers, proxy fights, and jawboning increases with the proportion of shares held by non-affiliated blockholders. This is because takeovers and proxy fights become not only cheaper but also more likely to succeed with increasing outside ownership. As argued by Shleifer and Vishny (1986), contests for corporate control become cheaper because high insider ownership mitigates the free-rider problem since large shareholder can share the costs with an outsider who is considering a takeover or a proxy fight. Not surprisingly, high outside ownership makes such control contests more successful as outsiders' voting power increases.

A plethora of empirical evidence support Shleifer and Vishny's (1986) theory. Shivdasani (1993) finds a positive (negative) relation between ownership of unaffiliated (affiliated)

blockholders and the likelihood of a hostile takeover attempt. Furthermore, there is a wide agreement among researchers examining institutional investor activism that institutional ownership increases targeting probability (see, e.g. Del Quercio and Hawkins 1999, Carleton et al. 1998, Smith 1996, Karpoff et al. 1996). With regard to hedge funds activism, Brav et al. (2006) finds that targets have higher institutional ownership, but they do not perform logistic analysis and are therefore unable to confirm whether the level of institutional ownership is important in activist hedge funds' targeting decisions.

2.3.6 Size

Economists widely agree that firm size affects the probability of takeover attempts. The idea is that it is more difficult to gain control in larger firms as any given fraction of ownership is more valuable. The theoretical foundations for this *wealth constraint hypothesis* are laid out in Demsetz and Lehn (1985).

Demsetz and Lehn (1985) analyse the determinants of the structure of corporate ownership. They posit that the fact that the market value of a given fraction of ownership in a firm increases with its market capitalisation results in a negative relation between ownership concentration and market capitalisation. Therefore, one should observe larger shareholdings in small companies and smaller stakes in large companies. This is of importance for would-be acquirers and dissident shareholders waging proxy contests and other activism. As size increases, it will become harder for them to gain control with any given amount of assets, resulting in an inverse relation between size and the probability of corporate control contests.

When considering activist hedge funds, it is not just the wealth constraint hypothesis of Demsetz and Lehn (1985) described above, but also the idiosyncratic risk that is likely to affect the size of their targets. As noted in Section 2.1, the average size of hedge funds in 2004 was only $160 million. Acquiring a 5% stake in a large company might introduce too much idiosyncratic risk on their portfolios making them opt for smaller targets.

The fact that takeover probability decreases with firm size has probably received most consistent empirical support in takeover literature (see, e.g. Palepu 1986, Ambrose and Megginson 1992, Powell 1997). In contrast, shareholder activism literature widely agrees on the fact that the probability of receiving shareholder proposals from activist institutional investors increases with size (see, e.g. Bizjak and Marquette 1998, Carleton et al. 1998, Opler and Sokobin 1997, Johnson and Shackell 1997, Karpoff et al. 1996, Smith 1996, Wahal

1996). However, this is consistent Smith (1996) who argues that as larger firms generally comprise a larger percentage of an institution's investment portfolio (perhaps due to indexing strategies) the expected benefits may be larger from targeting such firms.

Empirical evidence on hedge fund activism also suggests that hedge funds are wealth constrained and target smaller firms. For example, Brav et al. (2006) find that targets are significantly smaller than market/book matched control firms when measured with market capitalisation. Klein and Zur (2006) do not examine the size hypothesis because their control group consists of firms that are matched based on size. Furthermore, their sampling methodology does not allow them to asses whether size increases or decreases targeting probability.

2.4 Shareholder gains from hedge fund activism

This section first presents competing views about the efficacy of hedge fund activism in improving target firm performance and creating shareholder value. Second, a brief review of recent empirical evidence that examines the shareholder wealth effects associated with hedge fund activism is presented.

2.4.1 Competing views about hedge fund activism

Performance improvement hypothesis

Several theories suggest that the intervention by large shareholder in general and activist hedge funds in particular should be associated with increases in shareholder value. Activist hedge funds can remove poorly performing managers through takeovers, jawboning, and proxy fights (Shleifer and Vishny 1986) or initiating adverse publicity (Butz 1994). They can alleviate problems arising from free cash flow by pressuring managers to engage in bonding activities and disgorge excess cash and assume more debt (Jensen and Meckling 1976). They can also reverse excessive diversification by pressuring managers to divest businesses that could be more valuable under alternative management teams (Bethel et al. 1998). Finally, as modelled by Shleifer and Vishny (1986), the presence of a large shareholder may increase firm value because it increases the probability of subsequent control contests by reducing the free-rider problem suggested by Grossman and Hart (1980).

Undervaluation hypothesis

Another view is that activist hedge funds consistently target undervalued companies rather than improve their performance. This view parallels the hypothesis presented in Holderness and Sheehan (1985) that corporate raiders can spot undervalued firms. Activist hedge funds may have superior analysis skills in interpreting publicly available information that enable them to ascertain whether target firm is undervalued. They can also obtain private information as a by-product of monitoring enabling them to ascertain that the target is undervalued (Admati et al. 1994). Another form of the undervaluation hypothesis presented by Kraakman (1988) is that the firm's stock price is permanently underpriced for some unknown reason. This hypothesis presumes that the discount pricing can only be corrected by transactions that redeem shares for asset values such as takeover or liquidation. Accordingly, the presence of a large shareholder can facilitate such a takeover, as suggested by Shleifer and Vishny (1986).

If markets are aware that hedge funds are able to pick undervalued shares, then the announcement of a block purchase by an activist hedge fund should result in an increase in share price. This is consistent with the arguments of Chidambaram and John (1998) that large sophisticated investors can credibly convey information to the markets. However, the fact that activist hedge funds try to change firm policies is more consistent with the performance improvement hypothesis presented earlier. It should be noted, however, that such activities are not inconsistent with the undervaluation hypothesis either. Indeed, it is possible that both of these hypotheses may simultaneously explain share price reactions associated with targeting.

Increased demand hypothesis

Alternative explanation for positive abnormal returns around the event date could be an increase in demand for the shares of the target firm. Activist hedge funds need to accumulate at least 5% stake in target firms, which should increase demand of target's shares. If the excess supply curve of the target's shares is upward sloping, new demand could only be met at higher prices (see, e.g. Scholes 1972, Mikkelson and Parcth 1985).

Disturbance hypothesis

A competing view offered primarily by law scholars holds that shareholder activism in general tends to impair firm management, degrade performance, and decrease firm value. For example, Wohlstetter (1993) claims that most activist shareholders and pension fund

managers have neither the skills nor the experience to improve managers' decisions. Therefore, dissident shareholders' attempts to influence corporate policies tend to disrupt the firm's operations. Lipton and Rosenblum (1991) argue that even well-intended initiatives can distract managers and harm their ability to manage their firms effectively. In a more recent paper, Bainbridge (2005) claims that activist investors often pursue agendas that are in conflict with those of other shareholders as well as undermine the role of board of directors making corporate governance less effective. Kahan and Rock (2006) also argue that hedge funds may be too focused on short-term gains to care much about their long-term impact on firms.

2.4.2 Empirical evidence

Most studies that investigate whether various corporate control events create or destroy value examine the abnormal returns to target shareholders around the announcement of such activity. To the extent that the capital market efficiently incorporates new information into market prices, the short-term adjustment in prices should accurately reflect the expected wealth effects. This section provides an overview of the empirical findings on shareholder returns associated with hedge fund activism and other related corporate control events.

With regard to hedge fund activism, there are two working papers that examine the cumulative abnormal returns to target firm shareholders around the initial 13D filing date, namely Brav et al. (2006) and Klein and Zur (2006). Brav et al. (2006) calculate cumulative abnormal returns from 20 days before through 20 days after the initial 13D filing by activist hedge funds for 374 target firms in 2004-2005 and document mean and median returns of 6.8% and 4.7%, respectively, both significant at 1% level. They observe a run-up of about 1.8% before the 13D filing date, and a 2.2% jump in the two following days. Similarly, analysing 136 13D filings in 2003-2005, Klein and Zur (2006) document mean and median size-adjusted returns of 10.3% and 8.9% over a 61-day event window, respectively, both significant at 1% level. Klein and Zur also document a run-up in returns starting at about day -15 and a slight post announcement drift. The minor differences in their results arise from different sample period and the fact that Klein and Zur (2006) report only raw returns.

Brav et al. (2006) also examine the cross-section of cumulative returns and find that there are significant differences in returns between various characteristics of the events. Most prominently, they find that returns vary significantly with the stated goals of activist hedge funds. They find that activism that aims to provide finance, or the sale of the target, generates

the highest abnormal return, with mean abnormal return of 16.8% and 10.4%, respectively. Business strategy related activism also generates a significant abnormal return of 5.9%. Activism where the hedge fund does not state any specific agenda yields an abnormal return of 5.5%, on average. Surprisingly, they find that activism targeting at capital structure issues and governance issue exhibits near zero abnormal return. Neither Brav et al. (2006) nor Klein and Zur (2006) examine how returns from hedge fund activism differ from year to year. Additionally, neither of these papers analyse how target firm characteristics affect returns from hedge fund activism.

The results obtained by Brav et al. (2006) and Klein and Zur (2006) with regard to cumulative abnormal returns are rather similar to other corporate control events. Most interestingly, hedge fund activism seems to yield significantly higher returns than traditional institutional investor activism, which is generally associated with insignificant returns (Karpoff 1998). Compared to abnormal returns associated with proxy fights (Ikenberry and Lakonishok 1993: 4.27% over a one month period), hedge fund activism appears to generate slightly higher returns. The returns associated with block purchases by corporate raiders in the 1980s are also of similar magnitude, as shown by Bethel et al. (1998) and Holderness and Sheehan (1985) who document mean returns of 14.2% and 6.73% over similar event windows, respectively. In comparison to takeovers, 13D filings by activist hedge funds appear to generate somewhat lower returns, as indicated by the 15.9% abnormal return over a one month period around takeover announcements (Jensen and Ruback 1983).

3 Hypotheses

This section presents the hypotheses that will be tested in this study. The hypotheses are mainly based on literature reviewed in Section 2.2, but I also draw motivation from other sources. Section 3.1 formulates hypotheses relating various firm characteristics to the probability of targeting and to the sources of shareholder gains. Section 3.2 presents hypotheses about the shareholder wealth effects of hedge fund activism.

3.1 Determinants of hedge fund activism and sources of shareholder gains

This section presents hypotheses regarding firm characteristics that increase or decrease the likelihood of being targeted by activist hedge funds. In addition to explaining targeting likelihood they should explain cross-sectional variation in cumulative abnormal returns around the 13D filing date. I therefore present hypotheses about the relations between firm

characteristics and shareholder gains from hedge fund activism in this section as well. The first set of hypotheses relate to the targeting probability and are marked with "*a*" and the second set of hypotheses relate to sources of shareholder gains and are marked with "*b*".

Economists widely agree that managers may not always act in the best interest of shareholders or do so inefficiently. Manne (1965) argues that there exists a high and positive correlation between managerial efficiency and the share price of that firm. Therefore, low share price will not only be indicative of lacklustre managerial performance, but also the potential gains that can be realised by replacing the incumbent managers with more efficient ones. Specifically, managers who fail to maximise shareholder value may be disciplined by large shareholders. This discipline can take several forms, including taking the firm over or threatening to do so, putting it in play, mounting a proxy contest, jawboning, and initiating adverse publicity (Manne 1965, Shleifer and Vishny 1986, Butz 1994). Such actions may pressure managers to change firm policies and, on average, lead to improvements in firm performance and shareholder value. Thus, I expect that poorly performing firms are more likely to become targets of activist hedge funds, and that such firms would have strong incentives to deter activist hedge fund intervention by changing firm policies so as to improve performance and increase shareholder value.

H1a. *Poorly performing firms are more likely to be targeted by activist hedge funds.*

H1b. *Shareholder gains from hedge fund activism will be negatively related to pre-targeting performance.*

Jensen's (1986) free cash flow theory explains why firms with substantial cash flow are likely to destroy shareholder value. Specifically, managers of firms with substantial free cash flow may engage in pet projects, build empires, make dubious acquisitions, and diversify their firms excessively when the investment opportunities in their traditional business are low, all to the detriment of shareholders. Jensen (1986) argues that mitigation of agency costs of free cash flow is the main source of value creation in takeovers. Lehn and Poulsen (1989) confirm this view by documenting a positive relation between LBO premium and free cash flow. As noted several times earlier in this thesis, large shareholder can also mitigate agency problems arising from free cash flow. Therefore, I expect that:

H2a. *Firms with substantial free cash flow are more likely to be targeted by activist hedge funds.*

H2b. *Shareholder gains from hedge fund activism will be positively related to the level of free cash flow.*

The agency problems associated with free cash flow are especially severe when the firm faces limited growth opportunities since they may suffer from a shortage of positive NPV projects (Jensen 1986). If managers are specialised in the firm's current lines of business, then diversifying investments might be unprofitable as well. Thus, in addition to high level of free cash flow, activist hedge fund targets are likely to have fewer profitable investment opportunities. Based on the discussion, I posit that:

H3a. *Firms with low growth opportunities are more likely to be targeted by activist hedge funds.*

H3b *Shareholder gains from hedge fund activism will be negatively related to growth opportunities.*

A commonly suggested mechanism for containing the agency problems of excess liquidity is the takeover market (Jensen 1986). Similarly, Pinkowitz (2002) suggests that takeovers should discipline cash-rich firms. However, Harford (1999) and Pinkowitz (2002) both find that the likelihood of becoming a takeover target is significantly negatively related to the holding of excess cash suggesting that cash serves as a deterrent to would-be bidders. Excess cash enhances the ability of a target to defend itself by such means as share repurchases, acquiring a competitor of the bidders and filing antitrust litigation, or acquiring the bidder itself (Bagwell 1991, Stulz 1988, Dann and DeAngelo 1988). However, Faleye (2004) suggests that proxy fights are an effective mechanism for addressing the agency problems of excess liquidity since the defences a cash-rich firm may employ against a hostile bidder are largely ineffective against dissident shareholders waging a proxy fight. Similarly, I expect that hedge funds not deterred by excess cash. Thus, I have the following hypotheses.

H4a. *Firms with substantial cash holdings are more likely to be targeted by activist hedge funds.*

H4b. *Shareholder gains from hedge fund activism are positively related to cash holdings.*

Jensen and Meckling (1976) show that management can engage in bonding activities to eliminate or reduce the potential for agency problems. In the context of excess free cash flow,

debt creation without the retention of proceeds enables managers to effectively bond their promise to payout future cash flows. Low leverage indicates absence of bonding activities and thus higher potential for agency problems. High leverage also deters takeovers. First, for any given fraction of shares held by management, an increase in leverage will result in a larger fraction of voting rights controlled by the management (Harris and Raviv 1988). Second, the covenants attached to debt can substantially strengthen management's bargaining position and make hostile takeovers less likely (Stulz 1988), especially in the case where the suitor is seeking restructuring of the firm. Thus, lower leverage suggests that there is a higher potential for reducing agency problems and that interventions are more likely to succeed. Therefore I expect that:

H5a *Firms with low leverage are more likely to be targeted by activist hedge funds.*

H5b *Shareholder gains from hedge fund activism are negatively related to leverage.*

One specific cause of poor firm performance, especially in the 1980s, appears to have been excessive diversification. Jensen (1986) and Shleifer and Vishny (1989) argue that managers have an incentive to excessively diversify their firms at the expense of shareholders. Indeed, empirical evidence from the 1980s support the hypothesis that diversification decreases shareholder value. Comment and Jarrel (1995) show that higher focus is associated with higher firm values. Berger and Ofek (1995) show that diversified companies trade at a substantial discount when compared to their more focused counterparts. However, the value destruction associated with diversification generates large profit opportunities for outsiders who are able to increase corporate focus. Activist hedge funds can mitigate these problems by bringing pressuring manager to undertake divestitures and other value increasing changes.

H6a. *Highly diversified firms are more likely to be targeted by activism hedge funds*

H6b. *Shareholder gains from hedge fund activism are positively related to the degree of diversification.*

Undervaluation is a commonly suggested motivation for hedge funds to engage in activism by the financial press. Similarly, a plethora of economists argue that undervaluation is a key motive for takeovers (Palepu 1986) and LBOs (Opler and Titman 1993). The argument is that firms with low Tobin's q values are "cheap buys". Shleifer and Vishny (2003) model this formally and posit that undervalued firms make more attractive takeover targets. In addition,

Holderness and Sheehan (1985) hypothesised that corporate raiders in the 1980s were able to spot undervalued firm. In line with this, it is fair to assume that sophisticated hedge fund managers have superior analysis skills in interpreting publicly available information or can obtain private information as a by-product of monitoring (Admati et al. 1994) that enable them to ascertain whether target firm is undervalued. Another form of the undervaluation hypothesis presented by Kraakman (1988) is that the firm's stock price is permanently underpriced for some unknown reason. This hypothesis presumes that the discount pricing can only be corrected by transactions that redeem shares for asset values such as takeover or liquidation. Accordingly, the presence of a large shareholder can facilitate such a takeover, as suggested by Shleifer and Vishny (1986). Therefore I expect that:

H7a. *Undervalued firms are more likely to be targeted by activist hedge funds*

H7b. *Shareholder gains from hedge fund activism will be negatively related to the degree of undervaluation*

Insider ownership may reduce the likelihood that a firm is targeted by an activist hedge fund. First, high insider ownership mitigates agency problems because it aligns the interests of managers and shareholders (Jensen and Meckling 1976). In this case, there should be little opportunity for outside investors to improve performance. High insider ownership also makes it harder to take over the firm or replace management (Stulz 1988). Therefore, we have the following hypotheses:

H8a. *Firms with high insider ownership are less likely to be targeted by activist hedge funds.*

H8b. *Shareholder gains from hedge fund activism are negatively related to insider ownership.*

Shleifer and Vishny (1986) predict that the presence of large outside blockholder increases the likelihood of being targeted by takeovers, proxy fights, and jawboning. Theoretically, large shareholders can mitigate Grossman and Hart's (1980) free-rider problem by sharing some of the costs a possible suitor faces in accumulating a stake in the firm. In addition, large institutional investors are easier to coordinate with and are considered more likely to support proposals by other activist investors (Del Quercio and Hawkins 1999). Therefore, I expect that firms with high institutional ownership are more likely to be targeted by activist hedge

funds. In such cases, activist hedge funds are also more likely to get their improvements implemented, which should result in higher returns.

H9a. *Firms with high institutional ownership are more likely to be targeted by activist hedge funds.*

H9b. *Shareholder gains from hedge fund activism are positively related to institutional ownership.*

Firm size may affect the likelihood of being targeted by activist hedge funds. Remember that to be included in the sample, activist hedge funds need to file a schedule 13D with the SEC, which requires at least 5% ownership. Demsetz and Lehn (1985) posit the market value of a given fraction of ownership in a firm increases with its market capitalisation, which should in turn result in a negative relation between ownership concentration and market capitalisation. The wealth constraints hypothesis is likely to play an especially important role in the case of activist hedge funds since hedge funds do not have substantial amounts of assets under management (on average, hedge funds have $160 million of assets under management). What is more, larger investments in target companies could increase the systematic risks of their portfolios too much. Smaller firms are also more susceptible of information asymmetry, which makes them vulnerable to undervaluation (Myers and Maljuf 1984). Moeller et al. (2004) show that target gains from takeovers are negatively correlated with size. In line with this, I expect that shareholder gains from hedge fund activism will be lower in larger firms.

H10a. *Larger firms are less likely to be targeted by activist hedge funds.*

H10b. *Shareholder gains from hedge fund activism are negatively related to size.*

Kahn and Winton (1998) conjecture that large shareholder intervention should be most likely in situations that are relatively accessible to outsider investors: mature or low-technology industries and situations where management is clearly sub par. In contrast, they argue that it is harder for outsiders to know what to do in firms that specialise in new technologies and have high R&D focus. Therefore, I expect activist hedge funds to avoid R&D intensive firms. Kahn and Winton (1998) also suggest that implementing improvements in high R&D firms is difficult and likely to involve delays. Therefore, I expect that shareholder gains from hedge fund activism are lower in such firms.

H11a. *R&D intensive firms are less likely to be targeted by activism hedge funds.*

H11b. *Shareholder gains from hedge funds activism will be lower in R&D intensive firms.*

Liquidity of a firm's stock may also affect the likelihood of being targeted by an activist hedge fund. As discussed in Section 2.2 Grossman and Hart's (1980) free-rider problem is likely to deter potential buyers of large blocks of shares as they have to pay for the improvements they intend to carry out. High liquidity mitigates this problem as it is easier to accumulate large blocks without a significant price impact (Maug 1998). Thus I expect that:

H12a. *Firms whose share is more liquid are more likely to be targeted by activist hedge funds.*

H12b. *Shareholder gains from hedge fund activism will be positively related to the liquidity of a firm's shares.*

3.2 Shareholder wealth effects

Economists widely agree that large shareholders can mitigate agency problems by wielding control over management through takeovers or takeover threats, proxy fights and jawboning (Manne 1965, Shleifer and Vishny 1986, Butz 1994). Activist investors can also have superior analysis skills (Holderness and Sheehan 1985) or they can obtain private information as a by-product of monitoring (Admati et al. 1994) enabling them to ascertain if firms are undervalued and consistently target such firms. If markets are aware that hedge funds are able to pick undervalued shares, then 13D filings by activist hedge funds should result in increases in share prices. Alternative explanation for positive abnormal returns around the event date could be an increase in demand for the shares of the target firm. If the excess supply curve of the target's shares is upward sloping, new demand could only be met at higher prices (see, e.g. Scholes 1972, Mikkelson and Parcth 1985). Therefore, I hypothesise that:

H13. *Hedge fund activism creates shareholder value and is therefore associated with increases in target firm share prices around the 13D filing date.*

The number of firms targeted by activist hedge funds as well the number of hedge funds pursuing activist strategies have increased substantially over 2000-2006 (see Section 4.2). Bradley et al. (1988) present a hypothesis regarding the relation between diminishing returns and competition between bidding firms in the acquisitions market. They argue that the best opportunities in the acquisition market are taken first meaning that the value derived from

takeovers is likely to decline over time. They also argue that competition between bidding firms is likely to decrease returns to acquirers. Thus, I hypothesise that:

H14. *Cumulative abnormal returns from hedge fund activism will decline over time as the number of firms targeted and the number of hedge funds pursuing activist strategy increase.*

4 Data and methodology

The first subsection describes the institutional background to Schedule 13D filings. The second part of this section provides a description of the data used in this thesis. The third part defines the variables that are examined. Finally, the fourth part introduces the methodological approaches applied in this thesis.

4.1 13D filings

There is no central database that records hedge fund activism events. However, such events can be identified using 13D filings by hedge funds that can be considered as pursuing activist strategies. Section 13D of the Exchange Act of 1934, passed by U.S. Congress to regulate the method and timing of tender offers, requires anyone who acquires more than 5% of a public corporation's outstanding shares with the intention of influencing firm policies to file a Schedule 13D, a disclosure document, with the SEC within ten days of surpassing the 5% ownership threshold.

In particular, according to the Section 13D, these include events that would result in: a) the acquisition of additional securities or disposal of securities of the issuer; b) a merger, reorganisation, liquidation involving the issuer or any of its subsidiaries; c) material disposals of issuer's assets; d) change in present board of directors or management; e) change in capitalisation or dividend policy; f) any other material change in the issuer's business or corporate structure; g) changes in the firm's charter or bylaws; h) delisting of issuer's shares; i) any class of equity security eligible for termination of registration; or j) any action similar to any of those enumerated above.

Among other items, this filing includes the name and background of each acquiring individual or of any individuals who control the acquiring corporations. In addition, Item 4 of Schedule 13D requires the filer to declare the reasons for acquiring the shares, particularly if the intention is to engage in merger and acquisition activity, seek a sale of the firm or its assets, change capitalisation or dividend policy, or demand other types of policy changes. Schedule

13D filings are publicly available through the SEC EDGAR filing system[11]. Hence, 13D filings can be used to identify events where an activist hedge fund is seeking to influence firm policies.

In contrast, passive institutional investors that acquire more than 5% of the company's stock and do not intend to seek control at the target firm are required to file a Schedule 13G within 45 days of crossing this ownership threshold. Typically, the filing of a Schedule 13G does not indicate an activist event. However, if an institutional investor did change its initial passive purpose and decide to become active, they would need to file a Schedule 13D to announce this change in the purpose of investment.

4.2 Sample description

4.2.1 Sample and descriptive statistics

The core data used in this study consist of a unique hand-collected set of 470 activist hedge fund-target pairs between 1/1/2000 and 31/12/2006. The core data was obtained using a two-step procedure similar to that applied by Brav et al. (2006) and Klein and Zur (2006). First, a comprehensive list of 194 activist hedge funds was compiled by performing extensive news searches in Lexis-Nexis database and other news sources for stories mentioning terms such as "hedge fund", "activism", and "activist" in various combinations. The news search yielded in total 194 hedge funds (including few individual investors such as Carl Icahn) that were considered as pursuing an activist strategy. Second, a list of activist hedge fund-target firm pairs was compiled by searching 13D filings by the names of the 194 activist funds from the SEC EDGAR filing system between 2000 and 2006. The SEC EDGAR search for 13D filings by activist hedge funds and individuals yields a total of 911 activist hedge fund-target pairs. To be included in the final sample, hedge fund-target firm pairs must satisfy following criteria:

1. The Schedule 13D is filed between 1/1/2000 and 31/12/2006 by an activist hedge fund;

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[11] EDGAR, the Electronic Data Gathering, Analysis, and Retrieval system, performs automated collection, validation, indexing, acceptance, and forwarding of submissions by companies and others who are required by law to file forms with the U.S. Securities and Exchange Commission (SEC). These filings are available at http://www.sec.gov/edgar.shtml.

2. The target firm is listed in New York Stock Exchange (NYSE), NASDAQ National Market (NASDAQ), or American Stock Exchange (AMEX);
3. The target firm is not a financial firm (SIC codes 60 to 67);
4. If a firm is targeted more than once in a single year, the firm is included in the sample only by the first 13D filing.

The final core sample includes 470 hedge fund-target pairs, 414 unique target firms, and 94 activist hedge funds that have data on all key variables described in Section 4.2.2. Table 1 stratifies the sample by the year of targeting. A major limitation of this study, however, is the exclusion of hedge fund activism events in which the ownership of the fund remains below the 5% threshold. Furthermore, the sample may not be exhaustive of all hedge fund activism events in 2000-2006 because the screening process for activist hedge funds may have missed some funds altogether. However, I believe that the sample includes all important hedge fund activism events because the ones that have been left out have not received a sufficient amount of media attention or are carried out by lesser-known hedge funds.

To address the question why some firms are targeted by activist hedge funds and others are not, I construct a control group that consists of firms that were not subject to 13D filings by activist hedge funds during 2000-2006. For this purpose, I first obtain NYSE, NASDAQ, and AMEX constituent lists from Thomson Financial for 2000-2006. Second, I remove financial firms with SIC codes ranging from 60 to 67. I also remove firms that were subject to 13D filings by activist hedge funds because they are already included in the target sample. Finally, I gather the same data (described in Section 4.2.2) for control firms as I did for activist hedge fund targets and remove firms that do not have key data available on Thomson Worldscope. The final control sample includes 18,696 firm-years that were not targeted by activist hedge funds and that have data available for all key variables.

Table 1: Hedge fund activism in 2000-2006

The table reports the number of NYSE, NASDAQ, and AMEX listed firms that were subject to 13D filings by activist hedge funds in 2000-2006, the number of activist hedge funds that submitted 13D filings at the respective firms, and mean market capitalisation of target firms at year end before the 13D filing year. Year is the calendar year in which the Schedule 13D was filed. Number of targets refers to the number of filed Schedule 13Ds during a particular year, which equals the number of targeted firms. Number of activist hedge fund refers to how many different activist hedge funds filed Schedule 13Ds during a particular year. Mean market capitalisation is the mean year end market value of equity for target firms, as reported by Worldscope.

Year	Number of targets	Number of nontargets	Targets as % of population	Number of activist hedge funds	Mean market capitalisation ($ million)
2000	22	2 605	0.8%	15	346.4
2001	26	2 402	1.1%	14	357.3
2002	33	2 622	1.2%	22	467.1
2003	68	2 724	2.4%	28	383.4
2004	88	2 704	3.2%	36	632.1
2005	108	2 808	3.7%	49	1465.8
2006	125	2 831	4.2%	45	1570.6
Total	470	18 696	2.5%	94	997.1

Table 1 describes the frequency of hedge fund activism by year. In all, 470 13D filings by 94 activist hedge funds took place in 2000-2006, representing on average 2.5% of the entire population of NYSE, NASDAQ, and AMEX listed firms that meet my selection criteria. The most prominent feature of Table 1 is the dramatic increase in the number of firms targeted by activist hedge funds from 22 in 2000 to 125 in 2006. The proportion of firms experiencing hedge fund activism has also increased from 0.8% in 2000 to 4.2% in 2006. Moreover, the number of activist hedge fund pursuing activist strategy has increased three-fold, reflecting the increase in the number hedge funds and amount of funds under management. For example, according to Hedge Fund Research Inc, a research firm, the number of hedge funds has increased from 39 in 1990 to 890 in 2005, with assets estimated to reach one trillion in 2006. With assets under management, the size of targets has also increased from $346 million in 2000 to $1.57 billion in 2006 measured by mean market capitalisation. Indeed, huge companies such as Time-Warner, General Motors, and Kerr-McGee have been first-hand witnesses to the increasing clout of activist hedge funds.

Table 3 shows the distribution of target and control firms by industry. The industries with the highest frequency of hedge fund activism include business services and retailers. The high number of targets in the business services sector probably reflects the trend that activist hedge funds are increasingly trying to apply private equity model in public companies to increase value. Indeed, many funds explicitly state that they want to replicate the private equity model in the public markets. Business services sector is ripe for private equity as the level cash flow is high and volatility low. The high number of retail firms in the sample may arise from the fact that many of these firms own significant amounts of real estate, which could be sold at a

profit. Activist hedge funds argue that the recent surge in real estate values in not fully reflected in the retailers' market prices making the companies undervalued. Overall, there is no other industry clustering in the sample

Table 2: Hedge fund activism by Fama-French 48 industry

This table reports, by industry, the number and fraction of activist hedge fund targets and control firm-years in the same industry. Targets are NYSE NASDAQ and AMEX listed firms that were subject to 13D filings by activist hedge funds while control firm-years were not. Industry data is organised by Fama-French 48 industry classification.

		Control sample		Target sample				Control sample		Target sample	
Industry	Code	N	%	N	%	Industry	Code	N	%	N	%
Agriculture	1	77	0.4%	1	0.2%	Automobiles and trucks	24	269	1.4%	5	1.1%
Food products	2	334	1.8%	10	2.1%	Aircraft	25	114	0.6%	1	0.2%
Candy and soda	3	56	0.3%	0	0.0%	Shipbuilding, railroad equipment	26	59	0.3%	1	0.2%
Alcoholic beverages	4	98	0.5%	1	0.2%	Defense	27	42	0.2%	5	1.1%
Tobacco products	5	30	0.2%	0	0.0%	Precious metals	28	26	0.1%	0	0.0%
Recreational products	6	214	1.1%	4	0.9%	Nonmetallic mining	29	53	0.3%	2	0.4%
Entertainment	7	270	1.4%	14	3.0%	Coal	30	31	0.2%	2	0.4%
Printing and publishing	8	155	0.8%	8	1.7%	Petroleum and natural gas	31	867	4.6%	11	2.3%
Consumer goods	9	279	1.5%	12	2.6%	Utilities	32	757	4.0%	13	2.8%
Apparel	10	343	1.8%	7	1.5%	Telecommunications	33	650	3.5%	21	4.5%
Healthcare	11	386	2.1%	7	1.5%	Personal services	34	241	1.3%	14	3.0%
Medical equipment	12	772	4.1%	18	3.8%	Business services	35	2645	14.1%	100	21.3%
Pharmaceutical products	13	1300	7.0%	18	3.8%	Computers	36	860	4.6%	15	3.2%
Chemicals	14	399	2.1%	7	1.5%	Electronic equipment	37	1308	7.0%	23	4.9%
Rubber and plastic products	15	130	0.7%	8	1.7%	Measuring and control equipment	38	591	3.2%	8	1.7%
Textiles	16	61	0.3%	0	0.0%	Business supplies	39	235	1.3%	11	2.3%
Construction materials	17	346	1.9%	11	2.3%	Shipping containers	40	59	0.3%	1	0.2%
Construction	18	279	1.5%	3	0.6%	Transportation	41	535	2.9%	14	3.0%
Steel works, etc.	19	260	1.4%	7	1.5%	Wholesale	42	784	4.2%	21	4.5%
Fabricated products	20	64	0.3%	0	0.0%	Retail	43	1154	6.2%	28	6.0%
Machinery	21	711	3.8%	16	3.4%	Restaurants, hotels, and motels	44	355	1.9%	10	2.1%
Electrical equipment	22	337	1.8%	8	1.7%	Other	48	160	0.9%	4	0.9%

4.2.2 Activism types

Analysis of Item 4s in the 13D filings reveals significant heterogeneity in activist hedge fund demands at target companies. I divide different types of demands into seven categories, which are not mutually exclusive. Together, I refer to the seven categories as "activism type".

General category includes all events where the hedge funds do not specify any demands; rather they state a general demand to increase shareholder value through discussions with management. For example, Wilshire Enterprises Inc was subject to a Schedule 13D filed by Bulldog Investors on 17 August 2006 that stated:

"The filing persons have acquired the shares of WOC [Wilshire Enterprises] for investment purposes. The reporting persons may communicate with management to discuss ways to enhance shareholder value".

Corporate governance category includes all events related to firing CEOs, changing board composition, or rescinding takeover defences. As an example, Third Point's Daniel Loeb

wrote a letter to Star Gas Partners' CEO Irik P. Sevin, which was attached to a Schedule 13D filed on 14 February 2005, that stated:

"Sadly, your ineptitude is not limited to your failure to communicate with bond and unit holders. A review of your record reveals years of value destruction and strategic blunders which have led us to dub you one of the most dangerous and incompetent executives in America. (I was amused to learn, in the course of our investigation that at Cornell University there is an "Irik Sevin Scholarship." One can only pity the poor student who suffers the indignity of attaching your name to his academic record.) I have known you personally for many years and thus what I am about to say may seem harsh, but is said with some authority. It is time for you to step down from your role as CEO and director so that you can do what you do best: retreat to your waterfront mansion in the Hamptons where you can play tennis and hobnob with your fellow socialites. The matter of repairing the mess you have created should be left to professional management and those that have an economic stake in the outcome."

Demand sale category includes events where the hedge funds demand a sale of the target company, or some of its assets to a third party (in most cases) or to themselves. As an example, S1 Corp was subject to a Schedule 13D filed by Ramius Capital on 29 March 2006 that stated:

"The Reporting Persons purchased the Shares based on the belief that the Shares were undervalued and represented an attractive investment opportunity. The Reporting Persons are concerned about the competitive position of the Issuer, especially in light of the fact that the Issuer has lost more than 75% of its market value since January 2002. The Reporting Persons believe that the Issuer has valuable core assets but the current business strategy employed by management has and continues to result in a deterioration of stockholder value. The Reporting Persons have serious concerns about the ability of the current Board of Directors to maximize stockholder value. On March 29, 2006, Ramius Capital delivered a letter to the Chairman and Chief Executive Officer of the Issuer expressing its belief that the Issuer's assets are undervalued and that the best way to unlock shareholder value is through the sale of the Issuer.

Capital structure category relates to demands with respect to disgorging excess cash through dividends, share repurchases, or leveraged recapitalisations. For example, Massey Energy Company was subject to a Schedule 13D filed by Jana Partners on 16 September 2005 that stated:

"The Reporting Person believes that the Shares at current market prices are undervalued and represent an attractive investment opportunity...On September 14, 2005, the Reporting Person discussed with representatives of the Issuer, including Donald Blankenship, the Chairman, President and CEO of the Issuer, the Reporting Person's belief that the Issuer could unlock significant value for shareholders through a prompt repurchase of its common stock. Such representatives of the Company stated that they would consider taking such action. Therefore, following this discussion, the Reporting Person sent a letter to Mr. Blankenship outlining the benefits of a prompt share repurchase and stating its belief that the Issuer should undertake such action."

Strategy category includes events where the hedge fund's aim is to change the target firm's operating strategy. For example, H.J. Heinz Company was subject to a Schedule 13D filed by Trian Fund Management on 24 April 2006 that stated:

"The Filing Persons acquired the Shares for investment purposes because they believe that the Shares were undervalued. The Filing Persons believe that the Issuer has a valuable group of core brands but that the business strategy employed by management for the better part of a decade has not resulted in a significant increase in shareholder value...The Filing Persons see opportunities to create value at the Issuer through sharper strategic focus, better operational execution and more efficient uses of capital...and expect to publicly release a report prepared by them that examines the Issuer's performance, proposes various strategies for the enhancement of shareholder value, and analyzes the potential financial impact of such strategies.

Oppose M&A category includes all events where the hedge fund is opposing a pending M&A deal; either demanding a higher price for their shares or discouraging the target firm to go ahead with a planned acquisition. For example, Mylan Laboratories was subject to a Schedule 13D filed by Icahn Associates on 7 September 2004 that stated:

"The Registrants acquired the Shares because they believe the Shares to be undervalued in the market place... The Registrants' present intention is to oppose and solicit proxies against the Issuer's proposed merger with King Pharmaceuticals, Inc. The Registrants have made plans to meet with Robert J. Coury, the Issuer's CEO, this week."

Financing category takes all events where a hedge fund is willing to extend financing to the target firm to implement growth strategies, or help it in financial distress. This category includes only two observations, so I decide not to give an example for the sake of space.

Table 2 on the following page presents the target sample divided into subsamples by activism types described on previous page. The number of observation does not match the sample size as the seven categories are not mutually exclusive. The table shows that general category represents 65% of activism events in the sample. However, this may arise from the fact that some hedge funds just state the intention to increase shareholder value, but later demand other policy changes using other means. Corporate governance related proposals take 22% of the sample followed by demand to put the company for sale or divest assets with 15%. Capital structure proposals we almost as frequent as sale and divestiture proposals with 12% of total. Activist hedge funds demanded strategic changes and opposed M&A deals less frequently, as suggested by their 7% and 5% proportions in the sample, respectively. Finally, financing category includes only two cases.

Table 3: Hedge fund activism types

The table presents the 470 hedge fund activism events in 2000-2006 divided into categories according to activism type, i.e. the type of activist hedge fund demands at target firms. Categories are not mutually exclusive so one event can appear in more than one category.

	Activism type							
	General	Corporate governance	Demand sale	Capital structure	Strategy	Oppose merger	Financing	Total
N	305	103	72	58	31	24	2	470
% of total	64.9%	21.9%	15.3%	12.3%	6.6%	5.1%	0.4%	

4.3 Variables applied in the study

This section describes the variables that are applied in this paper. The first subsection elaborates on the dependent variables for logit and OLS regressions. The second subsection defines the independent variables that are used in the regressions and explains the rationale behind their use.

4.3.1 Dependent variables

Activism dummy: is a dummy variable that equals one if the firm was subject to a 13D filing by an activist hedge fund during my sample period of 2000-2006 and zero otherwise. In other words, activism dummy equals one for activist hedge fund targets and zero for the control firms. This variable is used as a dependent variable in the logit regressions. Further elaboration can be found in Section 4.4.1.

$CAR_{[-t, t]}$: is the cumulative abnormal return measured over various event windows where day 0 is the 13D filing date and $-t$ and t are the start and end dates of the event window, respectively. The purpose of this variable is to proxy for the target firm shareholder wealth effects associated with hedge fund activism. Cumulative abnormal returns are widely used by economists to examine the wealth effects of various corporate events (see, e.g. Weston et al. 2004). The abnormal return is calculated based on market model parameters estimated from days -300 to -51. The returns of the S&P 500, over the corresponding time period, are used as a proxy for the market's return. The event windows used in this study are [-50, 50], [-20, 20], [-2, 2], and [0, 0]. Brav et al. (2006) and Klein and Zur (2006) study returns to hedge fund activism using [-20, 20] and [-30, 30] event windows, respectively. Stock price data for calculation of CARs is obtained from Datastream. The methodology of calculating CARs is described in detail in Section 4.4.2. This variable is used as the dependent variable in OLS regressions to analyse the sources of shareholder gains.

4.3.2 Independent variables

This subsection defines the independent variables used in logit and OLS models. The expected signs for the variables are in brackets after the variable names. The first and second brackets give the expected signs for the logit regression and OLS regression, respectively. Accounting data is from Thomson Worldscope and the stock return data is from Thomson Datastream. All variables are calculated as of the year end before the 13D filing.

Net-of-market return [-], [-]: is the abnormal holding period return prior to the 13D filing year. The net-of-market return is calculated as follows:

$$\text{Net-of-market return} = \sum_{t=a}^{b} \left(R_{i,t} - R_{m,t} \right) \tag{1}$$

where $R_{i,t}$ is the return of firm i for month t, and a and b define the interval over which the return is calculated. $R_{m,t}$ refers to the return on the benchmark portfolio over the same period. The returns on the S&P500 index and Fama-French 2 x 3 market/book and size matched portfolios[12] are used as proxies for the market return. The returns are then calculated for 12 and 24 month periods using both benchmark indices. This variable has been applied in numerous shareholder activism related studies as a proxy for managerial performance (see, e.g. Brav et al. 2006, Smith 1996, Wahal 1996). The expectation is that poorly performing firms are more likely to be targeted, hence the negative expected sign. Moreover, the potential for improvement is bigger in such firm, resulting in a negative expected relation between this variable and CARs.

Free cash flow [+], [+]: is the undistributed free cash flow divided by total assets, and proxies for Jensen's (1986) free cash flow. Undistributed cash flow equals earnings before depreciation and amortisation less tax, interest, dividends and share repurchases following Jansen and Kleimeier (2003). Total assets equal the book value of assets. This variable is a better proxy for agency problems than return on assets used, for example, in Brav et al. (2006)

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[12] The portfolios, which are constructed at the end of each June, are the intersections of 2 portfolios formed on size (market equity, ME) and 3 portfolios formed on the ratio of book equity to market equity (BE/ME). The size breakpoint for year t is the median NYSE market equity at the end of June of year t. BE/ME for June of year t is the book equity for the last fiscal year end in t-1 divided by ME for December of t-1. The BE/ME breakpoints are the 30th and 70th NYSE percentiles. The portfolios for July of year t to June of t+1 include all NYSE, AMEX, and NASDAQ stocks for which we have market equity data for December of t-1 and June of t, and (positive) book equity data for t-1. Fama and French calculate returns on these portfolios, which are available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

and Klein and Zur (2006) because it accounts for the management discretion in the distribution of cash flow to shareholders. The expectation is that firms with high free cash flow are more likely to invest in negative NPV projects, and are therefore more likely to be targeted. Furthermore, the level of free cash flow is expected to be positively related to cumulative abnormal returns as the potential for improvements is bigger.

Cash ratio [+], [+]: is the cash and marketable securities divided by total assets at year-end prior to the 13D filing year. Cash ratio has been applied as a proxy for agency problems, for example, in Faleye (2004)'s study on the determinants of proxy fights and in Klein and Zur's (2006) working paper on hedge fund activism. From an agency perspective, firms that have a high endowment of liquid assets may be more prone to engage in nonvalue maximising behaviour, so I expect a positive relation between this variable and the likelihood of being targeted. Similarly, I expect a positive relation between this variable and CAR.

Debt ratio [-], [-]: is the total debt divided by total assets one at year-end prior to the 13D filing year. In examining the determinants of proxy fights, Faleye (2004) uses debt ratio as a proxy for agency problems; low debt ratio indicates lack of bonding activities on the part of managers to reduce these problems. High leverage also acts as a takeover deterrent (Stulz, 1988). Therefore I expect debt ratio to have a negative relation with targeting probability. Moreover, as higher debt ratio indicates that managers have engaged in bonding activities, there should be a negative relation between this variable and CARs.

Sales growth [-], [-]: is the average geometric growth rate in firm's sales for a period of two years prior to the 13D filing year. The variable has been widely used by economists as a proxy for growth opportunities, including Lehn and Poulsen (1989) in predicting LBOs and Powell (1997) and Palepu (1986) in predicting takeovers. Firms facing low growth opportunities in their own businesses are more likely to spend free cash flow in negative NPV projects or diversify excessively to the detriment of shareholders (Jensen 1986). Thus, the likelihood of targeting is expected to decrease with sales growth. Similarly, as low growth firms are more prone to suffer from agency problems, intervention by activist hedge funds should decrease the costs arising from agency problems relatively more. This results in a negative expected relation between sales growth and CARs.

Diversification [+], [+]: is the number of business segments for which a firm reports a four-digit SIC code. There are numerous interpretations for this variable. It may proxy overinvestment of free cash flow (Jensen 1986), managerial entrenchment (Shleifer and

Vishny 1986), or undervaluation (Berger and Ofek 1995). Brav et al. (2006) and Bethel et al. (1998) use diversification as a measure of poor performance arising from agency problems and potential undervaluation. Whether diversification results in poor performance or undervaluation, it is expected to be positively related to the targeting probability and cumulative abnormal returns.

Tobin's q [-], [-]: is the sum of market value of equity and book value of debt divided by the book value of assets. Existing literature offers various interpretations for Tobin's *q*, including managerial performance (Servaes 1991), growth opportunities (Opler and Titman 1993), and undervaluation (Hasbrouck 1985). All explanations should, however, result in a negative expected sing in both logit and OLS models. However, to tell apart between these different hypotheses, I decompose Tobin's *q* into two separate variables: industry *q* and abnormal *q*, which proxy for industry-wide undervaluation and firm-specific undervaluation compared to industry peers, respectively.

Industry q [-], [-]: is the median Tobin's *q* of firms in the same Fama-French 48 industry[13]. The purpose of this variable is to proxy industry wide undervaluation. Empirical precedent for this type of interpretation can be found in Ang and Chen (2006) and Rhodes-Kropf et al. (2006). Industry *q* can alternatively be interpreted as growth opportunities within a given industry as explained in previous paragraph. In either case, I expect it to receive a negative sign in both logit and OLS models.

Abnormal q [-], [-]: is the difference between a particular firm's Tobin's *q* and respective industry *q* measured in percents. This variable measures firm-specific undervaluation and is free from alternative interpretations of the simple Tobin's *q*. This method uses the product of the individual firm's book value and its industry median market/book value as the measure of the firm's fair value. For example, if a firm's abnormal *q* is -0.20, it can be said that the firm is "undervalued" by 20% compared to its Fama-French 48 industry peers. Furthermore, using abnormal *q* alleviates problems arising from "high water raises all boats" phenomenon, as it implicitly controls for industry-wide and time-specific valuation errors. This type of variable has been used by Ang and Chen (2006) and Rhodes-Kropf et al. (2006) to test the market driven acquisitions theory by Shleifer and Vishny (2003). The expectation is that undervalued

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[13] Industry classifications and corresponding four-digit SIC codes are available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/changes_ind.html.

firms are more likely to be targeted, hence the negative expected sign. With regard to CARs, the expected sign is also negative.

Insider ownership [-], [-]: is the percentage of closely held shares as reported by Thomson Worldscope at year end prior to the 13D filing. It includes shares held i) by officers, directors (and families) ii) in trust iii) by other corporations iii) by pension/benefit plans iii) by individuals who hold more than 5% of outstanding shares. McConnel and Servaes (1990) and Bethel et al. (1998) use closely held shares as a proxy of insider ownership and hence as a proxy of severity of agency problems. Firms with low insider ownership are expected to be more likely among activist hedge fund targets. As high insider ownership makes it more difficult to gain control and successfully implement improvements, the expected sign with regard to CARs is also negative.

Institutional ownership [+], [+]: is the percentage of shares held by institutional investors, such as pension funds and mutual funds. Smith (1996) uses institutional ownership variable in his logistic regressions predicting CalPERS activism. As hypothesised in Section 3.1, firms with high institutional ownership are more likely to be targeted by activist hedge funds because institutional owners may mitigate the free-rider problem, hence the positive expected sign. As the probability of success is higher in such cases, the expected relation between institutional ownership and CARs is also positive.

Ln (Market capitalisation) [-], [-]: is the natural logarithm of year end market capitalisation. I take the natural logarithm to alleviate problems arising from skewed data. I expect ln(market capitalisation) to enter the logit models with negative coefficient due to wealth constraints faced by activist hedge funds. Also, I expect it to enter OLS models with a negative coefficient, following the finding of Moeller et al. (2004) that the relation between target size and CAR is negative in acquisitions.

R&D dummy [-], [-]: is a dummy variable that equals one if the firm reported R&D expenditures in Worldscope, and zero otherwise. Brav et al. (2006) use R&D expense in their univariate tests. As suggested by Kahn and Winton (1998) it is more difficult to improve performance in R&D intensive firms as they are harder to understand. Therefore, I expect that this variable enter the logit models with a negative sign.

Liquidity [+], [+]: is the mean yearly share turnover of a firm's stock for the year prior to the 13D filing. Liquidity mitigates the free-rider problem (Maug 1997) and is therefore expected to have a positive effect on the targeting probability and cumulative abnormal returns. Healy

et al. (1999) are among researchers that have used share turnover as a measure of liquidity. Brav et al. (2006), on the other hand, use Amihud liquidity measure in their univariate tests.

Activism type dummies: are dummy variables that represent the 7 different categories of demands set out by activist hedge funds in the Item 4: Purpose of Transaction section of the Schedule 13D. These categories include: general, corporate governance, demand sale, capital structure, strategy, oppose merger, and financing. The categories are not mutually exclusive. For example, when Jana Partners on March 3 2005 demanded Kerr-McGee Corp to sell its chemicals business, distribute returns to shareholders as well as proposed to nominate directors, dummy variables demand sale, capital structure, and corporate governance receive values of one and others would equal zero. The purpose of the inclusion of these variables in the OLS models is to control for the cross-sectional variation in returns between the types of activism.

SIC dummies: are dummy variables that represent the ten one-digit SIC codes (0-9). For example, a manufacturing firm with a two-digit SIC code of 31 would have a dummy variable equal to one for a one-digit code of three and zero otherwise. This inclusion in the regression models will control for possible industry effects that may be occurring in the data.

Year dummies: are dummy variables that represent the individual years in the study. For example, the Schedule 13D filed at Cutter and Buck Inc on July 21 2004 by Pirate Capital LLC is assigned a dummy equal to one for the year 2004 and zero for all other years. The purpose for the inclusion of these variables is to control for possible time effects. In OLS regressions, these variables control for the cross-sectional variation in returns over time.

4.4 Methodology

This section describes the methodologies applied in this study. Fist subsection elaborates on the logistic model that is used to examine the determinants of hedge fund activism. Second subsection presents the event study methodology. Finally, the third subsection describes the OLS regression model used to analyse the sources of shareholder gains.

4.4.1 Multivariate logit model

In an attempt the examine the determinants of hedge fund activism I compare characteristics of firms that were targeted by activist hedge fund with those of firms that were not targeted. In particular, I do this by estimating a multivariate logit probability model to specify the functional relationship between a firm's characteristics and its likelihood of being targeted by

an activist hedge fund. Similar models have been used to evaluate factors that affect the likelihood of takeovers (Palepu 1986, Lehn and Poulsen 1989), shareholder activism (Smith 1996, Wahal 1996), and block share purchases by active individual investors (Bethel et al. 1998).

The multivariate logit model specifies the probability, P_{ij}, that firm i will belong to event j (e.g., be a target of activist hedge fund if $j = 1$, or a non-target if $j = 0$) as a function of a vector, Z_i, of measured characteristics, X_i, of the firm i. As described in Dougherty (2002), the probability of the occurrence of the event is determined by the function:

$$p_i = F(Z_i) = \frac{1}{1+e^{-Z_i}}, \tag{2}$$

where

$$Z_i = \beta_j X_i = \beta_0 + \beta_1 X_1 + \ldots + \beta_n X_n, \tag{3}$$

where β_j is a vector and $\beta_0, \beta_1, \ldots, \beta_n$ are the individual parameters (corresponding to firm characteristics X_i) to be estimated. The parameters of the model are estimated by maximum likelihood estimation. The maximum likelihood estimation will yield consistent estimators which are asymptotically efficient, that is, efficient in large samples.

There is no measure of goodness of fit equivalent to R^2 in maximum likelihood estimation to measure the model's explanatory power. In default, numerous measures have been proposed for comparing alternative model specifications. However, Ameniya (1981) recommends considering more than one measure, including the pseudo- R^2 and chi-squared, and comparing the results. Nevertheless, the standard significance tests are similar to those for the standard regression model. The significance of an individual parameter/coefficient can be evaluated via its t statistic.

4.4.2 Cumulative abnormal returns

To evaluate the shareholder wealth effects of hedge fund activism I examine abnormal returns to target firm shareholders around the 13D filing date by activist hedge funds. This study uses standard market model based event study methodology presented by Brown and Warner (1985) and reviewed by Weston et al. (2004) to determine the cumulative abnormal returns to shareholders around the targeting date.

The market returns (R_{mt}) are based on the logarithmic daily returns for the S&P 500 index. The returns for a particular hedge fund activism target firm shareholders (R_{it}) are regressed on the market returns for the clean estimation period of -300 to -51 days before the 13D filing date (t=0) to get the market model parameter $\hat{\alpha}_i$ and $\hat{\beta}_i$ estimates for the respective firm using the market model:

$$R_{it} = \alpha_i - \beta_i R_{mt} + \varepsilon_{it}, \tag{4}$$

where R_{mt} is the return on the market index for day t, β_i measures the sensitivity of returns of firm i to the market return, α_i measures the mean return not captured by the market return and β_i, and where the disturbance term, ε_{it}, has mean zero and is independent of R_{mt}. The abnormal return to firm i shareholders on day t (AR_{it}) is then calculated using the market model parameters obtained from equation (1) in the following formula:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt}. \tag{5}$$

Once abnormal returns for the respective firm and the time period are determined, cumulative abnormal return for firm i for the duration of the event window around 13D filing date (t=0) is calculated by summing together the daily abnormal returns (AR_{it}):

$$CAR_{i,[p1,p2]} = \sum_{t=p1}^{p2} AR_{it}, \tag{6}$$

where $p1$ and $p2$ are the starting and ending days of the event window, respectively. Cumulative abnormal returns are calculated for the entire sample of activist hedge fund targets, as well as their subsamples.

4.4.3 OLS regression model

In addition to explaining the likelihood of being targeted by an activist hedge fund, firm characteristics should explain cross-sectional variation in cumulative abnormal returns around the 13D filing dare. Hence, I estimate the cumulative abnormal returns as a function of firm characteristics and control for targeting year and activism type. For this purpose, I perform ordinary least squares regressions of CARs around the initial 13D filing on various independent variables described in Section 4.3.2.

The OLS model, as laid out by Dougherty (2002), assumes that variable Y (the cumulative abnormal return around the event date) depends on k-1 explanatory variables $X_2,\ldots, X_k$ according to a true, unknown relationship

$$Y_i = \beta_1 + \beta_2 X_{2i} + \ldots + \beta_k X_{ki} + u_i . \quad (7)$$

Given a set on n observations on Y, $X_2,\ldots, X_k$, least squares regression in used to fit the equation

$$\hat{Y}_i = b_1 + b_2 X_{2i} + \ldots + b_k X_{ki} . \quad (8)$$

This is done by minimising the sum of the squares of the residuals, which are given by $e_i = Y_i - \hat{Y}_i$, by choosing $b_1,\ldots, b_k$ so as to minimise $\sum_{i=1}^{n} e_i^2$. The regression coefficient of each X variable provides an estimate of its influence on Y, controlling for the effects of all other X_i. To evaluate the joint explanatory power of the variables included in the regression model, I use the F test of goodness of fit, the null hypothesis being H_0: $\beta_k = 0$. The t tests test the significance of the coefficient of each variable individually.

Table 4 summarises the hypotheses that will be tested in this thesis and the corresponding variables. Table 4 also shows the expected signs of variables in both multivariate logistic and OLS regressions. Not surprisingly, the expected signs in logit and OLS regressions are same without exception as activist hedge funds are ultimately motivated by profits.

Table 4: Hypotheses, variables, and economic theory

The table summarises the hypotheses formulated in Sections 3.1, gives the variable names (and theories they are proxying for) that are used to test the hypotheses. The table also presents the expected sign of each variable's coefficient in both logistic and ordinary least squares regressions.

Hypothesis	Variable	Proxying for	Expected sign	
			Targeting probability	Shareholder gains
H1	Net-of-market return	Managerial performance	Negative	Negative
H2	Free cash flow	Agency problems	Positive	Positive
H3	Sales growth	Growth opportunities	Negative	Negative
H4	Cash ratio	Agency problems, takeover deterrence	Positive	Positive
H5	Debt ratio	Agency problems, takeover deterrence	Negative	Negative
H6	Diversification	Agency problems, undervaluation	Positive	Positive
H7	Tobin's q, Industry q, Abnormal q	Undervaluation, perfomance, growth opportunities	Negative	Negative
H8	Insider ownership	Agency problems, takeover deterrence	Negative	Negative
H9	Institutional ownership	Mitigation of the free rider problem	Positive	Positive
H11	Ln (market capitalisation)	Size (wealth constraints)	Negative	Negative
H12	R&D dummy	Difficulty of improvement implementation	Negative	Negative
H13	Liquidity	Mitigation of the free rider problem	Positive	Positive

5 Results and analysis

This section presents and analyses the empirical results of this thesis. Section 5.1 compares target firms to nontargets, examines the correlations between variables and, most importantly, presents the multivariate logistic regression estimates about the relations of targeting likelihood and firm characteristics. Section 5.2 examines the CARs associated with hedge fund activism. Section 5.3 investigates the relations between CARs and firm characteristics.

5.1 Determinants of hedge fund activism

5.1.1 Univariate analysis

Table 5 on the next page presents descriptive statistics for the entire sample of 470 hedge fund activism targets and 18,696 nontarget control firms-years. Table 5 also reports the t-statistics for differences in means and Wilcoxon test statistics for differences in medians for each variable between targets and control firms. For some variables the number of observations is smaller due to missing data and omission of outliers[14].

[14] The problem of missing data is especially severe in case of net-of-market returns as some firms do not have enough price history. Second, data on institutional ownership are gathered from SEC database, which does not have data on all firms in the sample. Cash ratio and sales growth are affected by the exclusion of outliers at 1% level.

Table 5: Descriptive statistics and univariate tests

The table shows mean and median values of variables for target and control samples, and the corresponding tw0 tailed t-statistics for equality of means and Wilcoxon test statistics for equality of medians. The target sample consists of 470 NYSE, NASDAQ, and AMEX listed firms that were subject to a 13D filing by an activist hedge fund in 2000-2006 and the control sample consists of 18,696 firm-years that were not. *Net-of-market return (S&P 500)* is the one year unadjusted return prior to the 13D filing year less same period return on S&P 500 index; *Net-of-market return (Fama-French 2x3)* is the one year unadjusted return prior to the 13D filing year less same period return on respective Fama-French 2x3 market/book and size portfolio; *Free cash flow* is earnings before depreciation and amortisation less tax, interest, dividends and share repurchases divided by total assets; *Cash ratio* is the cash and marketable securities divided by total assets; *Debt ratio* is the total debt divided by total assets; *Sales growth* is the average geometric growth rate in firm's sales for a two year period before the 13D filing year; *Diversification* is the number of business segments for which a firm reports four-digit SIC code; *Tobin's q* is the sum of market value of equity and book value of debt divided by the book value of assets; *Industry q* is the median Tobin's *q* of firms in the same Fama-French 48 industry; *Abnormal q* is the percentage difference between Tobin's *q* and industry *q*; *Insider ownership* is the percentage of closely held shares as reported by Thomson Financial; *Institutional ownership* is the percentage of shares held by institutional investors as reported by Thomson Financial; *Market capitalisation* is the year end market value of firm's common stock; *R&D dummy* is a dummy variable that equals one if the firm reported R&D expenditures, and zero otherwise; *Liquidity* is the mean yearly share turnover of a firm's stock. For each variable, ***, **, and * indicate that the value for target firms is significantly different from the value for control firms at the 1%, 5%, and 10% levels, respectively.

	Control sample			Target sample			Difference test	
Variable	Mean	Median	n	Mean	Median	n	Means (t)	Medians (z)
Net-of-market return (S&P 500)	0.03	0.05	17 659	-0.04	-0.03	451	-2.69 ***	-3.21 ***
Net-of-market return (Fama-French 2x3)	0.15	0.06	17 734	0.00	-0.04	451	-4.98 ***	-4.31 ***
Free cash flow	0.01	0.06	18 696	0.03	0.05	470	2.50 ***	0.70
Cash ratio	0.19	0.09	18 490	0.18	0.11	467	-1.16	0.70
Debt ratio	0.20	0.17	18 696	0.20	0.18	470	0.00	0.70
Sales growth	0.23	0.10	18 124	0.11	0.06	466	-7.04 ***	-5.92 ***
Diversification	2.37	2.00	18 696	2.51	2.00	470	1.48 *	1.60
Tobin's q	2.14	1.55	18 477	1.60	1.32	470	-11.58 ***	-7.10 ***
Industry q	1.71	1.53	18 696	1.68	1.56	470	-1.68 **	1.58
Abnormal q	0.27	0.00	18 477	-0.04	-0.15	470	-12.66 ***	-8.86 ***
Insider ownership	0.28	0.24	18 692	0.25	0.22	450	-2.96 ***	-1.15
Institutional ownership	0.59	0.66	16 416	0.66	0.73	329	4.31 ***	3.76 ***
Market capitalisation	3629.88	340.97	18 696	997.13	260.87	470	-15.03 ***	-2.71 ***
R&D dummy	0.49	0.00	18 696	0.44	0.00	470	-1.79 **	-1.78 *
Liquidity	2.33	1.13	18 696	1.73	1.22	464	1.57 *	1.07

Activist hedge fund targets differ from control firms with regard to several characteristics. The most prominent result of Table 5 is the difference in valuation variables Tobin's *q*, industry *q*, and abnormal *q*. For target firms, mean and median Tobin's *q* are significantly lower compared to control firms at 1% level, suggesting either that targets are undervalued or have limited growth prospects. The results are comparable to Brav et al. (2006) who report significantly lower Tobin's *q* for activist hedge fund targets. The split of Tobin's *q* into industry *q* and abnormal *q* provides more interesting results. For targets, industry *q* is significantly lower only in the mean at 5% level, suggesting that target firms face somewhat lower growth opportunities than nontargets or come from undervalued industries. The most profound result relates to abnormal *q*. Mean and median abnormal *q* for targets are -3.89% and -15.00%, respectively, suggesting that they are substantially undervalued compared to

their Fama-French 48 industry peers. The differences in abnormal q are significant at 1% level.

Table 5 also shows target firms have significantly underperformed the S&P 500 index while control firms appear to have slightly overperformed the S&P 500 when the returns are calculated for a period of one year ending before the 13D filing year. Similarly, when the net-of-market returns are calculated based on six Fama-French 2*3 size and market/book portfolios, targets fare significantly worse than control firms. When the net-of-market returns are calculated over a 2 year period prior to targeting (not reported), the differences are similar, although not significant when the benchmark index is the S&P 500. These results support the hypothesis that target firms should experience poor performance prior to targeting. In contrast, existing research on hedge fund activism indicates either that hedge fund targets' performance is at par with control firms (Brav et al. 2006) or that target firms overperform control firms (Klein and Zur 2006). The differences may be attributed to the fact that they use size and market/book matched control groups. Klein and Zur (2006) also compare activist hedge fund targets to firms that were subject to 13D filings by nonhedge fund activists and find similar results. The fact that their samples are smaller and from shorter periods of time may also affect the results.

Table 5 also reports free cash flow for the entire sample. Mean and median free cash flow for targets are 2.79% and 5.00%, respectively, compared to 0.79% and 6.00% for control firms. The difference is only significant in the mean at 1% level. Similar results are obtained for return on assets (not shown). These results suggest that target firms enjoy, on average, somewhat higher cash flows that nontargets, but the differences arise because some target firms appear to have extremely high free cash flow, while majority of them enjoy merely average cash flows when compared to control firms. These results are somewhat different to those obtained by Brav et al (2006) who report significantly higher cash flows for target firms. Targets also experience lower sales growth compared to nontargets. The significantly lower sales growth for target firms implies that although free cash flow does not differ significantly among targets and nontargets, targets retain too much cash given their lower growth opportunities. The combination of slightly above average cash flows and significantly lower growth opportunities indicates that target firms are susceptible to agency problems. It should be noted that Brav et al. (2006) do not report lower sales growth for targets. Again, this discrepancy probably arises from their choice of size and market/book matched control

group. Using market/book as matching criteria implicitly controls for growth opportunities so it is not surprising that they do not find differences in sales growth.

An interesting aspect regarding the results of Table 5 is that there are no significant differences in cash ratio or debt ratio between targets and nontargets. On closer inspection of the data, it appears that among the control group there are many firms with extremely high cash ratio. Even after excluding outliers at 1% level from the top, highest cash ratios remain well above 90%. This has substantial effects on univariate results. However, this skewness is less likely to cause bias in multivariate logit regressions because maximum likelihood estimation is used. Brav et al. (2006) find that target have significantly lower cash holdings and higher leverage. Klein and Zur's (2006) findings in terms of cash ratio and debt ratio are similar to this thesis. However, when compared to nonhedge fund activist targets, Klein and Zur (2006) report significantly higher cash holdings for activist hedge fund targets.

When considering other target characteristics, there are several important differences between hedge fund targets and control firms. Targets appear to be slightly more diversified than control firms, a finding that is in line with Brav et al. (2006). However, the difference is only significant in the mean at 10% level. Higher diversification may indicate information asymmetries and, hence, undervaluation. The prospect of breaking up a highly diversified firm may also attract activist hedge fund interest. Although the result regarding diversification is similar to Bethel et al. (1998) who examine activist investors in the 1980s, it should be noted that their results are more robust, indicating that targeting excessively diversified firms may have been peculiar to the 1980s. This view is consistent with the increase in corporate focus towards 1990s documented by Comment and Jarrell (1995). Table 5 also shows that insider ownership is lower for target firms, although the difference is only significant in the mean at 1% level. This result is consistent with agency theory as higher managerial ownership helps to align interests between managers and shareholder (Jensen and Meckling 1976). High insider ownership may also deter activist hedge funds because it is harder win control in firms with high insider ownership (Stulz 1988). Brav et al. (2006) nor Klein and Zur (2006) do not include insider ownership in their choice of variables, so no comparison to previous activist hedge fund research can be made. However, this result is in line with previous literature that examines the characteristics of firms involved in takeovers (McConnell and Servaes 1991), proxy fights (Faleye 2004), and shareholder activism (Smith 1996).

Moreover, target firms appear to be smaller than control firms when measured with market capitalisation. The mean and median market capitalisation for targets are $997 million and $261 million, respectively. Corresponding figures for the control group are $3.63 billion and $340 million, which are both significantly larger than those of targets at 1% level. The results regarding target size are comparable to those of Brav et al (2006) and Klein and Zur (2006).

Table 5 also shows that target firms come from less R&D intensive industries, have higher institutional ownership, and lower liquidity. Mean R&D dummy value for target firms is 0.44, compared to 0.49 for nontargets, indicating that targets are less R&D intensive firms. This result is in line with the analysis of Kahn and Winton (1998) who argue that improvements are harder to implement in R&D intensive firms. Higher institutional ownership can be explained by the fact that institutional investors can mitigate the free-rider problem (Shleifer and Vishny 1986).

Table 6: Descriptive statistics for activism type subsamples

The table shows mean values of variables for activism type subsamples and control sample and the test statistics of an F-test for differences in means between subsamples for each variable. The target sample consists of 470 NYSE, NASDAQ, and AMEX listed firms that were subject to a 13D filing by an activist hedge fund in 2000-2006 and the control sample consists of 18,696 firm-years that were not. *Net-of-market return (S&P 500)* is the one year unadjusted return prior to the 13D filing year less same period return on S&P 500 index; *Net-of-market return (Fama-French 2x3)* is the one year unadjusted return prior to the 13D filing year less same period return on respective Fama-French 2x3 market/book and size portfolio; *Free cash flow* is earnings before depreciation and amortisation less tax, interest, dividends and share repurchases divided by total assets; *Cash ratio* is the cash and marketable securities divided by total assets; *Debt ratio* is the total debt divided by total assets; *Sales growth* is the average geometric growth rate in firm's sales for a two year period before the 13D filing year; *Diversification* is the number of business segments for which a firm reports four-digit SIC code; *Tobin's q* is the sum of market value of equity and book value of debt divided by the book value of assets; *Industry q* is the median Tobin's *q* of firms in the same Fama-French 48 industry; *Abnormal q* is the percentage difference between Tobin's *q* and industry *q*; *Insider ownership* is the percentage of closely held shares as reported by Thomson Financial; *Institutional ownership* is the percentage of shares held by institutional investors as reported by Thomson Financial; *Market capitalisation* is the year end market value of firm's common stock; *R&D dummy* is a dummy variable that equals one if the firm reported R&D expenditures, and zero otherwise; *Liquidity* is the mean yearly share turnover of a firm's stock. For each variable ***, **, and * indicate that the mean values differ significantly between subsamples at the 1%, 5%, and 10% levels, respectively.

		Subsample by type of activism						Subsample F-test	
Variable	Control sample	General	Corporate governance	Company sale	Capital structure	Strategy	Oppose merger	F-stat	Prob > F
Net-of-market return (S&P 500)	0.03	-0.02	-0.09	-0.11	0.05	-0.25	0.08	1.61	0.14
Net-of-market return (Fama-French)	0.15	0.01	-0.04	-0.04	0.11	-0.23	0.12	1.61	0.14
Free cash flow	0.01	0.04	-0.01	0.05	0.02	0.04	0.04	3.17***	0.00
Cash ratio	0.19	0.17	0.20	0.18	0.17	0.21	0.22	1.1	0.36
Debt ratio	0.20	0.20	0.22	0.20	0.22	0.22	0.25	0.84	0.54
Sales growth	0.23	0.12	0.02	0.08	0.14	0.04	0.04	4.44***	0.00
Diversification	2.37	2.51	2.38	2.50	2.52	2.35	2.25	0.4	0.88
Tobin's q	2.14	1.65	1.50	1.41	1.44	1.41	1.52	1.46	0.19
Industry q	1.71	1.68	1.68	1.60	1.68	1.61	1.70	0.78	0.59
Abnormal q	0.27	-0.01	-0.13	-0.10	-0.12	-0.12	-0.11	1.36	0.23
Insider ownership	0.28	0.26	0.27	0.23	0.27	0.24	0.23	0.87	0.52
Institutional ownership	0.59	0.66	0.62	0.67	0.64	0.68	0.62	0.59	0.74
Market capitalisation	3629.88	986.32	636.57	1061.08	927.99	988.42	1538.74	0.48	0.83
R&D dummy	0.49	0.46	0.42	0.40	0.38	0.35	0.50	0.55	0.77
Liquidity	2.33	1.66	1.38	1.81	1.57	1.92	2.44	2.65**	0.02
Number of observations	18 969	305	103	72	58	31	24		

Table 6 presents mean values of variables for the control sample and for each activism type subsample. In general, target firm characteristics do not differ significantly among subsamples, but there are significant differences with regard to three variables. First, targets attracting capital structure and oppose M&A type of activism overperform the market during the year prior to targeting while other targets appear to suffer from underperformance. Second, it appears that targets of corporate governance related proposals fare significantly worse than other targets when measured with free cash flow. Finally, there are significant differences in sales growth between targets in different categories. Targets in general and capital structure categories appear to experience higher than average sales growth in two years prior to targeting when compared to other targets. On the other hand, targets of corporate governance, strategy, and oppose M&A related proposals seem to experience significantly lower sales growth than targets in general.

5.1.2 Correlations

Table 7 presents a matrix of the pairwise correlations between the explanatory variables as well as theirs correlations with an activist dummy variable which identifies firms that are targeted by activist hedge funds. This analysis will accomplish to equally important goals. First, it will provide preliminary insights into the relation between the occurrence of hedge fund activism and firm characteristics. Second, it helps to detect multicollinearity between the explanatory variables. A high level of correlation between explanatory variables may induce statistical instability in the regressions, suggesting that such variables should not be used simultaneously in regression models.

Table 7: Pairwise correlations matrix

The table shows pairwise correlation coefficients between variables used in this study. The sample covers 2000-2006 and consists of 470 NYSE, NASDAQ, and AMEX listed firms that were subject to 13D filings by activist hedge funds and 18,696 firm-years that were not. *Activism dummy* is a dummy variable that equals one for firms that were subject to 13D filings by activist hedge funds and zero otherwise; *Net-of-market return (S&P 500)* is the one year unadjusted return prior to the 13D filing year less same period return on S&P 500 index; *Net-of-market return (Fama-French 2x3)* is the one year unadjusted return prior to the 13D filing year less same period return on respective Fama-French 2x3 market/book and size portfolio; *Free cash flow* is earnings before depreciation and amortisation less tax, interest, dividends and share repurchases divided by total assets; *Cash ratio* is the cash and marketable securities divided by total assets; *Debt ratio* is the total debt divided by total assets; *Sales growth* is the average geometric growth rate in firm's sales for a two year period before the 13D filing year; *Diversification* is the number of business segments for which a firm reports four-digit SIC code; *Tobin's q* is the sum of market value of equity and book value of debt divided by the book value of assets; *Industry q* is the median Tobin's *q* of firms in the same Fama-French 48 industry; *Abnormal q* is the percentage difference between Tobin's *q* and industry *q*; *Insider ownership* is the percentage of closely held shares as reported by Thomson Financial; *Institutional ownership* is the percentage of shares held by institutional investors as reported by Thomson Financial; *ln(market capitalisation)*is the natural logarithm of year end market capitalisation; *R&D dummy* is a dummy variable that equals one if the firm reported R&D expenditures, and zero otherwise; *Liquidity* is the mean yearly share turnover of a firm's stock. For each pair of variables, ***, **, and * indicate that the correlation coefficient is different from zero at the 1%, 5%, and 10% levels, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Activism dummy	1.00															
(2) Net-of-market return (S&P500)	-0.02**	1.00														
(3) Net-of-market return (Fama-French)	-0.01*	0.45***	1.00													
(4) Free cash flow	0.01	0.10***	0.01	1.00												
(5) Cash ratio	-0.01	-0.04***	0.03***	-0.38***	1.00											
(6) Debt ratio	0.00	-0.01	-0.02**	0.07***	-0.47***	1.00										
(7) Sales growth	-0.03***	-0.06***	0.01	-0.03***	0.16***	-0.06***	1.00									
(8) Diversification	0.01**	0.01*	-0.03***	0.08***	-0.24***	0.19***	-0.07***	1.00								
(9) Tobin's q	-0.05***	0.25***	0.11***	-0.18***	0.40***	-0.28***	0.16***	-0.13***	1.00							
(10) Industry q	-0.01	0.05***	0.04***	-0.14***	0.41***	-0.24***	0.11***	-0.14***	0.39***	1.00						
(11) Abnormal q	-0.05***	0.24***	0.10***	-0.05***	0.25***	-0.21***	0.13***	-0.08***	0.87***	-0.02***	1.00					
(12) Insider ownership	-0.02**	-0.02***	0.00	-0.01	0.00	0.00	0.04***	-0.16***	-0.06***	-0.04***	-0.04***	1.00				
(13) Institutional ownership	0.03***	0.07*	-0.01	0.15***	-0.09***	0.10***	0.00	0.16***	0.03***	-0.10***	0.07***	-0.32***	1.00			
(14) ln (market capitalisation)	-0.02***	0.13***	0.00	0.14***	-0.07***	0.09***	0.03***	0.30***	0.22***	-0.01	0.26***	-0.35***	0.60***	1.00		
(15) R&D dummy	-0.01*	-0.04***	0.01*	-0.09***	0.37***	-0.28***	0.06***	-0.02***	0.22***	0.33***	0.10***	-0.10***	-0.03***	0.01**	1.00	
(16) Liquidity	0.00	0.02***	0.02**	0.00	0.01*	-0.01**	0.02**	0.00	0.02***	0.02**	0.03***	-0.01*	0.01	0.01	0.01	1.00

Table 7 shows that there is a significant negative relation between the activism dummy and net-of-market return variables. The correlation coefficient for net-of-market return is higher and significant at 1% level when the S&P 500 is used as a benchmark index, compared to lower correlation coefficient and only 10% significance between activist dummy and Fama-French adjusted returns. The valuation variables Tobin's *q* and abnormal *q* are also significantly negatively related to the occurrence of hedge fund activism. The correlation with sales growth and activism dummy is also negative and significant at 1% level. Furthermore, the correlation between activism dummy and free cash flow is positive but insignificant, a result that is in line with the univariate tests. Similarly, cash ratio and debt ratio have small correlations with activism dummy and are not significantly different from zero. In addition, there is a positive and significant relation between the activism dummy variable and diversification. Table 7 also shows that there is a negative and significant relation between the activism dummy and natural logarithm of market capitalisation, insider ownership, and the R&D dummy. The relation between the occurrence of activism and institutional ownership is significantly positive.

Table 7 also shows some interesting results with respect to the relations between the explanatory variables. First noteworthy aspect of Table 7 is the high negative correlation between cash ratio and free cash flow. This can be explained by cross-sectional differences in investment opportunities and operating needs. Indeed, Opler et al. (1999) model cash as a function of growth opportunities, volatility of cash flow, access to capital markets, and the cost of raising funds through assets sales and dividend cuts. Therefore, for example, firms with high and less volatile cash flows should hold less cash. Their model also explains the high and significantly negative correlation between cash and diversification. In addition, low Tobin's q firms require less cash as they face fewer investment opportunities, which is evident from the negative correlation coefficient between Tobin's q and cash ratio.

The second notable aspect is the correlations between valuation variables: Tobin's q, industry q, and abnormal q. While there is a very high and significant correlation of 0.89 between Tobin's q and abnormal q, the correlation coefficient between industry q and abnormal q is quite small. This indicates that one should not use Tobin's q and abnormal q simultaneously in logistics regression. Using industry q instead of Tobin's q alleviates problems arising from multicollinearity.

5.1.3 Multivariate logit regressions

This section provides answers to the main question of this thesis: why are some firms targeted by activist hedge funds while others are not? I begin the analysis by estimating logistic regressions with various specifications for the full target sample relating the probability of hedge fund activism to various explanatory variables described in Section 4.3.2. I then estimate logistic regressions for each subsample based on activism type. In each regression, the dependent variable is a binary variable that equals one for targets and zero for nontargets. The target sample consists of 470 activist hedge fund targets in 2000-2006. The nontarget control group consists of 18,696 NYSE, NASDAQ, and AMEX listed firm-years that were not subject to 13D filings by activist hedge funds in 2000-2006.

Table 8 reports the coefficients from six multivariate logit regressions for the full hedge fund activism sample and control firms. Table 8 uses S&P 500 index as a benchmark for net-of-market return while Table 9 uses Fama-French adjusted returns. Model I in both tables does not include variables derived from Tobin's q. Tobin's q is added to Model II. In Model III, Tobin's q is decomposed into industry q and abnormal q, which allows the assessment of firm-specific undervaluation. Debt ratio is dropped from Model IV due to the fairly high

correlation between cash and debt ratios. In Model V, cash is dropped and debt is reintroduced to the model. Finally, institutional ownership variable is included in Model IV (It was excluded from Models I-V due to low number of observations).

Table 8: Logit regressions using S&P500 as performance benchmark

The table reports the maximum likelihood regression coefficients and corresponding t-statistics (in parentheses under each coefficient) along with $\chi 2$, corresponding p-value, and pseudo R^2 for six logit regression models on the sample covering 2000-2006 and consisting of 470 NYSE, NASDAQ, and AMEX listed firms that were subject to 13D filings by activist hedge funds and 18,696 firm-years that were not. In each regression, the dependent variable is a dummy variable that equals one for firms that were subject to 13D filings by activist hedge funds and zero otherwise. Independent variable *Net-of-market return* is the one year unadjusted return prior to the 13D filing year less same period return on S&P 500 index; *Free cash flow* is earnings before depreciation and amortisation less tax, interest, dividends and share repurchases divided by total assets; *Cash ratio* is the cash and marketable securities divided by total assets; *Debt ratio* is the total debt divided by total assets; *Sales growth* is the average geometric growth rate in firm's sales for a two year period before the 13D filing year; *Diversification* is the number of business segments for which a firm reports four-digit SIC code; *Tobin's q* is the sum of market value of equity and book value of debt divided by the book value of assets; *Industry q* is the median Tobin's *q* of firms in the same Fama-French 48 industry; *Abnormal q* is the percentage difference between Tobin's *q* and industry *q*; *Insider ownership* is the percentage of closely held shares as reported by Thomson Financial; *Institutional ownership* is the percentage of shares held by institutional investors as reported by Thomson Financial; *ln(market capitalisation)*is the natural logarithm of year end market capitalisation; *R&D dummy* is a dummy variable that equals one if the firm reported R&D expenditures, and zero otherwise; *Liquidity* is the mean yearly share turnover of a firm's stock; *SIC dummies* are dummy variables that represent the ten one-digit SIC codes; *Year dummies* are dummy variables that represent the individual years. All variables are calculated as of the year end before the 13D filing. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at the 1%, 5%, and 10% levels, respectively.

	Expected	Dependent variable: 1 if target, 0 otherwise					
Independent variables	sign	I	II	III	IV	V	VI
Net-of-market return	-	-0.2474 ***	-0.0633	-0.0505	-0.0526	-0.0474	0.0081
		(-2.55)	(-0.61)	(-0.49)	(-0.51)	(-0.46)	(0.06)
Free cash flow	+	1.1185 ***	1.0439 ***	1.0660 ***	1.1010 ***	0.9648 ***	0.2908
		(2.97)	(2.41)	(2.44)	(2.53)	(2.34)	(0.59)
Cash ratio	+	-0.2064	0.2935	0.3243	0.4066 *		0.1036
		(-0.67)	(0.94)	(1.02)	(1.36)		(0.27)
Debt ratio	-	0.0351	-0.2280	-0.2483		-0.3600	-0.6490 **
		(0.11)	(-0.7)	(-0.76)		(-1.17)	(-1.67)
Sales growth	-	-0.8233 ***	-0.5930 ***	-0.5799 ***	-0.5858 ***	-0.5680 ***	-0.5490 ***
		(-4.02)	(-3.04)	(-2.98)	(-3.01)	(-2.95)	(-2.32)
Diversification	+	0.0713 **	0.0417	0.0399	0.0389	0.0346	0.0772 **
		(2.09)	(1.20)	(1.15)	(1.12)	(1.01)	(1.92)
Tobin's q	-		-0.4281 ***				
			(-5.85)				
Industry q	-			-0.4446 ***	-0.4383 ***	-0.4235 ***	-0.3611 ***
				(-3.02)	(-2.98)	(-2.98)	(-2.04)
Abnormal q	-			-0.8012 ***	-0.7923 ***	-0.7709 ***	-0.9022 ***
				(-6.02)	(-5.98)	(-5.94)	(-5.37)
Insider ownership	-	-0.0086 ***	-0.0082 ***	-0.0083 ***	-0.0083 ***	-0.0083 ***	-0.0044 *
		(-3.32)	(-3.19)	(-3.22)	(-3.25)	(-3.24)	(-1.36)
Institutional ownership	+						0.0157 ***
							(5.73)
ln (market capitalisation)	-	-0.1403 ***	-0.0799 ***	-0.0736 ***	-0.0763 ***	-0.0747 ***	-0.1930 ***
		(-4.96)	(-2.65)	(-2.42)	(-2.53)	(-2.46)	(-4.08)
R&D dummy	-	-0.1719 *	-0.0779	-0.0611	0.0001	-0.0251	-0.0684
		(-1.33)	(-0.59)	(-0.46)	(0.03)	(-0.19)	(-0.43)
Liquidity	+	-0.0048	0.0001	0.0001	0.0001	0.0001	-0.0023
		(-0.23)	(0.00)	(0.04)	(0.03)	(0.05)	(-0.08)
Intercept		-3.5543 ***	-1.5012 **	-3.0356 ***	-3.0988 ***	-3.0014 ***	-3.8726 ***
		(-9.96)	(-2.21)	(-6.80)	(-7.06)	(-6.75)	(-7.63)
SIC dummies		yes	yes	yes	yes	yes	yes
Year dummies		yes	yes	yes	yes	yes	yes
Number of observations		17 535	17 408	17 408	17 408	17 554	15 360
thereof targets		*430*	*430*	*430*	*430*	*432*	*307*
thereof nontargets		*17 105*	*16 978*	*16 978*	*16 978*	*17 122*	*15 053*
χ^2		228.78	270.86	276.91	276.32	278.62	256.25
(p-value)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Pseudo R^2		0.0567	0.0672	0.0687	0.0685	0.0687	0.0851

Overall, after controlling for size, industry, and years, the results indicate that undervalued firms suffering from agency problems are significantly more likely to be targeted by activist hedge funds. As shown in Table 8, the likelihood of targeting significantly negatively related to abnormal q and industry q in all model specifications, suggesting that activist hedge funds look for undervalued firms in low q industries. As the effects of abnormal q are robust across different specifications, the results strongly support the undervaluation hypothesis.

The significantly positive coefficients across Table 8 for free cash flow are in line with Jensen's (1986) free cash flow theory. The likelihood of targeting increases in free cash flow in all models except in Model VI that includes the institutional ownership variable. Corroborating evidence in support of the free cash flow hypothesis is found from the fact the likelihood of targeting significantly decreases in sales growth in all models. Regression results also show that the likelihood of targeting is positively related to diversification, an indication agency problems as well as bust-up potential, but not in a robust manner given the insignificant coefficients in Models II to V. Moreover, although the coefficients on net-of-market return are negative as expected, they do not appear to have any significant impact on the targeting probability, except in Model I, where Tobin's q is not included. This is surprising given the highly significant differences in net-of-market return between target and control firms in the univariate tests. The findings are inconsistent with the empirical evidence on institutional investor activism, where poor stock price performance increases targeting probability (see, e.g. Karpoff 1998, Gillan and Starks 1998).

Also, the coefficients for cash ratio are generally positive but insignificant, Model IV being the exception with a significant coefficient for cash ratio at 10% level. Similar results are obtained for debt ratio: the coefficients are generally negative but fail to gain any significance, except when the institutional ownership variable is introduced in Model VI. Even though the coefficients for cash ratio and debt ratio are generally insignificant, an important conclusion can be drawn from the evidence: activist hedge funds do not appear to be deterred by cash or leverage. This is not always the case for corporate acquirers who are sometimes deterred by high leverage and high cash holdings (Pinkowitz 2002, Harford 1999).

As shown in Table 8, ownership structure variables also take expected signs. Firms with high insider ownership are significantly less likely to become targets of activist hedge funds. However, the significance of the coefficient of the insider ownership variable decreases from 1% to 10% level when institutional ownership is introduced to the equation in Model VI. This

may be explained by the significantly negative correlation of -0.32 between the two variables. Nevertheless, the effects of insider ownership are robust and in line with agency theory. As can be observed from Model IV, the probability of targeting is significantly positively related to institutional ownership, suggesting that activist hedge funds look for companies where incumbent institutional investors help to alleviate the free-rider problem, or alternatively failed their monitoring duty or that they more likely to support the hedge fund's agendas.

Furthermore, the coefficient for ln(market capitalisation) is significantly negative across all specifications, indicating that hedge funds are wealth constrained as they avoid larger firms. Also, smaller firms may be susceptible to informational asymmetries and undervaluation (Myers and Maljuf 1984). When considering other control variables, the coefficients of the R&D dummy are negative as expected but insignificant in all models. Liquidity, too, fails to obtain any significance. As a whole, the models are all significant at 1% level as shown by the high chi-squared values but have quite low explanatory power. However, this is in line with previous literature that uses logistic models in similar context (see, e.g. Palepu 1986, Opler et al. 1998).

As there is some variation in the patterns of coefficients and significance between different specifications in Table 8, closer examination of Models I-VI is warranted. The most notable difference is the fact the net-of-market return variable obtains 1% significance in Model I, but the effect fails to persist in Models II-VI. Model I does not include variables derived from Tobin's q, which naturally leads to the conclusion that the significant coefficient for net-of-market return in the model is simply a market/book effect. However, the significance persists in Table 9 where size and market/book adjusted returns are used, but this may arise from that fact that I only divide firms into three groups based on book/market, which may not be sufficient to capture all its effects.

Additionally, the coefficient for and significance of cash ratio varies somewhat from model to model. The negative, although insignificant, coefficient for cash in Model I can be explained with the market/book effect since low Tobin's q firms hold less cash, as indicated by the positive and significant correlation coefficient of 0.40. Indeed, after controlling for Tobin's q, the sign of the coefficient turns positive, as expected. Moreover, the coefficient for cash ratio becomes significant at 10% level in Model IV, where debt ratio is not included due to the high correlation between these variables. The coefficients for debt ratio behave similarly to those of the cash ratio, which means that the above analysis also applies in the case of debt ratio.

The coefficients for diversification also show variation across different specifications. In Models I and VI, the probability of hedge fund activism increases significantly in diversification at 5% level, but the coefficients loose significance in Models II-V, although t-statistics are still reasonably high. Interestingly, in Model VI, the coefficient for diversification is significantly positive even though the model controls for market/book effect by using abnormal q and industry q. Moreover, free cash flow looses its significance and debt ratio becomes significant at 5% level in Model VI. The discrepancies between Models I-V and Model VI may be due to selection bias as data on institutional ownership are only available for some firms. On closer inspection, it appears that firms for which Thomson provides institutional ownership data are significantly larger when measured by market capitalisation.

Robustness checks

As a robustness check, I estimate the same logistic regressions as show in Table 8 using Fama-French adjusted returns, which control for size and book/market effects, in calculating net-of-market return variable. The results of these regressions are shown in Table 9. In general, the pattern of coefficients and significance are very similar to those obtained from Table 9, which leads me to conclude that the results are robust to the choice of benchmark in calculating net-of-market returns. It should be noted, however, that the t-statistics for the coefficients of net-of-market return increase slightly in all models except in Model I, suggesting that activist hedge funds put more emphasis on prior returns when compared to a more relevant benchmark. This result is somewhat similar to the findings in Morck et al. (1989) showing that tendency of the board to replace CEOs decreases with industry adjusted rather than the market adjusted performance.

Table 9: Logit regressions using Fama-French 2x3 portfolios as performance benchmark

The table reports the maximum likelihood regression coefficients and corresponding t-statistics (in parentheses under each coefficient) along with $\chi 2$, corresponding p-value, and pseudo R^2 for six logit regression models on the sample covering 2000-2006 and consisting of 470 NYSE, NASDAQ, and AMEX listed firms that were subject to 13D filings by activist hedge funds and 18,696 firm-years that were not. In each regression, the dependent variable is a dummy variable that equals one for firms that were subject to 13D filings by activist hedge funds and zero otherwise. Independent variable *Net-of-market return* is the one year unadjusted return prior to the 13D filing year less same period return on respective Fama-French 2x3 market/book and size portfolio; *Free cash flow* is earnings before depreciation and amortisation less tax, interest, dividends and share repurchases divided by total assets; *Cash ratio* is the cash and marketable securities divided by total assets; *Debt ratio* is the total debt divided by total assets; *Sales growth* is the average geometric growth rate in firm's sales for a two year period before the 13D filing year; *Diversification* is the number of business segments for which a firm reports four-digit SIC code; *Tobin's q* is the sum of market value of equity and book value of debt divided by the book value of assets; *Industry q* is the median Tobin's *q* of firms in the same Fama-French 48 industry; *Abnormal q* is the percentage difference between Tobin's *q* and industry *q*; *Insider ownership* is the percentage of closely held shares as reported by Thomson Financial; *Institutional ownership* is the percentage of shares held by institutional investors as reported by Thomson Financial; *ln(market capitalisation)*is the natural logarithm of year end market capitalisation; *R&D dummy* is a dummy variable that equals one if the firm reported R&D expenditures, and zero otherwise; *Liquidity* is the mean yearly share turnover of a firm's stock; *SIC dummies* are dummy variables that represent the ten one-digit SIC codes; *Year dummies* are dummy variables that represent the individual years. All variables are calculated as of the year end before the 13D filing. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at the 1%, 5%, and 10% levels, respectively.

	Expected	Dependent variable: 1 if target, 0 otherwise					
Independent variables	sign	I	II	III	IV	V	VI
Net-of-market return	-	-0.2276 ***	-0.0876	-0.0777	-0.0792	-0.0736	-0.0139
		(-2.70)	(-1.00)	(-0.88)	(-0.90)	(-0.85)	(-0.14)
Free cash flow	+	1.0621 ***	1.0396 ***	1.0672 ***	1.1023 ***	0.9661 ***	0.3078
		(2.85)	(2.44)	(2.48)	(2.57)	(2.39)	(0.63)
Cash ratio	+	-0.1947	0.2952	0.3243	0.4081 *		0.1006
		(-0.64)	(0.94)	(1.02)	(1.37)		(0.26)
Debt ratio	-	0.0315	-0.2319	-0.2519		-0.3638	-0.6545 **
		(0.10)	(-0.72)	(-0.78)		(-1.19)	(-1.68)
Sales growth	-	-0.8176 ***	-0.5941 ***	-0.5817 ***	-0.5875 ***	-0.5699 ***	-0.5534 ***
		(-4.00)	(-3.04)	(-2.99)	(-3.02)	(-2.97)	(-2.34)
Diversification	+	0.0704 **	0.0410	0.0393	0.0382	0.0340	0.0771 **
		(2.07)	(1.19)	(1.14)	(1.11)	(0.99)	(1.92)
Tobin's q	-		-0.4245 ***				
			(-5.83)				
Industry q	-			-0.4397 ***	-0.4333 ***	-0.4188 ***	-0.3578 ***
				(-2.99)	(-2.95)	(-2.94)	(-2.03)
Abnormal q	-			-0.7945 ***	-0.7856 ***	-0.7646 ***	-0.8976 ***
				(-6.01)	(-5.97)	(-5.93)	(-5.75)
Insider ownership	-	-0.0085 ***	-0.0081 ***	-0.0082 ***	-0.0083 ***	-0.0082 ***	-0.0043 *
		(-3.31)	(-3.17)	(-3.20)	(-3.23)	(-3.22)	(-1.35)
Institutional ownership	+						0.0157 ***
							(5.75)
ln (market capitalisation)	-	-0.1416 ***	-0.0793 ***	-0.0730 ***	-0.0757 ***	-0.0740 ***	-0.1925 ***
		(-5.03)	(-2.64)	(-2.40)	(-2.51)	(-2.44)	(-4.07)
R&D dummy	-	-0.1589	-0.0751	-0.0591	-0.0487	-0.0231	-0.0688
		(-1.23)	(-0.57)	(-0.45)	(-0.37)	(-0.18)	(-0.44)
Liquidity	+	-0.0004	0.0001	0.0002	0.0002	0.0002	-0.0023
		(-0.07)	(0.02)	(0.06)	(0.06)	(0.07)	(-0.08)
Intercept		-1.7580 ***	-1.5532 **	-1.5466 **	-1.6389 ***	-3.0204 ***	-3.7095 ***
		(-2.61)	(-2.30)	(-2.22)	(-2.39)	(-6.83)	(-6.94)
SIC dummies		yes	yes	yes	yes	yes	yes
Year dummies		yes	yes	yes	yes	yes	yes
Number of observations		17 598	17 468	17 468	17 468	17 617	15 411
thereof targets		*430*	*430*	*430*	*430*	*432*	*307*
thereof nontargets		*17 168*	*17 038*	*17 038*	*17 038*	*17 185*	*15 104*
χ^2		230.53	272.55	276.91	277.92	280.31	257.27
(p-value)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Pseudo R^2		0.0570	0.0675	0.0687	0.0689	0.0691	0.0854

As a further robustness check, I estimate the logistic regressions in Tables 8 and 9 using two year net-of-market returns in order to test whether the performance factor becomes significant when using returns from a longer period of time, but I do not report these results. The results

obtained using the two year returns are comparable to those reported earlier. Again, net-of-market return fails to gain any significance in predicting targeting probability after controlling for cross-sectional differences in investment opportunities. Surprisingly, as a result of using two year returns, diversification becomes significantly positively related to the targeting probability at least at 10% level in every model.

In addition, I examine the sensitivity of results to changes in the specification of control firms by estimating regressions using a different subset of the control sample. While my control sample does not include any cases of hedge fund activism in 2000-2006, it does include a great deal of firms that were subject to other kinds of corporate control activity, such as takeovers, proxy fights, shareholder activism by institutional investors, and bankruptcies. These events may be driven by the same underlying reasons and therefore affect the results of the regressions. Therefore, I exclude from the control group all firms that are reported to be "inactive" in Thomson Worldscope at the end of 2006 and conduct similar logistic regressions as in Tables 8 and 9 (not reported). In spite of the difference in firms that make up the control group in these regressions, I obtain the same pattern of coefficients and significance as in Tables 8 and 9. Thus, the findings do not appear to depend on the specification of the control sample.

5.1.4 Logit regressions for activism type subsamples

I also estimate logistic regressions for six subsamples according to the type of demands set forth in the 13D filing. The subsamples are: 1) general, 2) corporate governance, 3) capital structure, 4) strategy, 5) sale of the company, and 6) merger opposition related demands. I do not estimate logistic regressions for firms to whom activist hedge funds were willing to extend financing as there are only two such cases. Elaboration on these categories can be found in Section 4. The model specification used in the regressions of each subsample is the same as Model III in Tables 8 and 9.

It should be noted that there are two equally important shortcomings in this type of analysis. First, even though estimating separate regressions for each subsample allows me to analyse how different factors affect targeting likelihood in each subsample, it does not specifically test whether the factors are different from subsample to subsample. More importantly, if the same variable is found to affect the targeting likelihood, it is impossible to test in which subsample its effects are the strongest or the weakest. Thomas (1997) offers a partial solution to the problem. He suggests that one runs a logit regression where the dependent variable is one for

one subsample and zero for others. But, as Thomas (1997) notes, this approach only tests whether the characteristics of firm differ between subsamples, not their impact on targeting likelihood. Similar analysis of target characteristics between subsamples is carried out in Section 5.1, but using a different methodology. Another approach commonly used in empirical literature is the multinominal logit model (binominal logit is used in this thesis). However, the dependent variables in multinominal logit should be, at least in some way, ordinal, which they certainly are not in this thesis.

General

The first column of Table 10 on the following page shows logistic regression estimates for the subsample of 281 activism events with general demands to increase shareholder value and control firm-years. The dependent variable equals one for activism targets and zero otherwise. The events were activist hedge funds stated specific demands are not included in the regressions. It should be noted, however, that analysis of this subsample is not very interesting because it covers over 50% of the full sample and results are therefore likely to be very similar to the regressions estimates obtained in the previous section.

As shown in Table 10, the net-of-market return does not appear to be a factor in determining targeting likelihood in this subsample, although the sign of the coefficient is as expected. The coefficients for free cash flow, cash ratio, and debt ratio follow similar pattern and obtain roughly the same levels of significance as they do in Tables 8 and 9. The same can be said for sales growth and diversification, although the coefficient for sales growth is only significant at 5% level for this subsample. There are no notable differences in the coefficients for industry q and abnormal q either. With respect to other variables, I do not find any notable differences in the pattern and significance of coefficients, indicating that the drivers for this type of activism do not differ significantly from activism in general. A more plausible explanation would be that as the number of events in the general category takes over 50% of the full sample, the results presented in Tables 8 and 9 are driven by the motives of hedge funds to engage in this type of activism. Therefore, it is of paramount interest to analyse the other subsamples separately.

Table 10: Logit regressions for activism type subsamples

The table reports the maximum likelihood regression coefficients and corresponding t-statistics (in parentheses under each coefficient) for six different subsamples of hedge fund activism covering 2000-2006 and consisting of 470 NYSE, NASDAQ, and AMEX listed firms that were subject to 13D filings by activist hedge funds and 18,696 firm-years that were not. *General* category includes all events where the hedge funds do not specify any demands; rather they state a general demand to increase shareholder value through discussions with management. *Corporate governance* category includes events related to firing CEOs, changing board composition, or rescinding takeover defences. *Demand sale* category includes events where the hedge funds demand a sale of the target company, or some of its assets. *Capital structure* category relates to demands to disgorge excess cash. *Strategy* category includes events where the hedge fund's aim is to change operating strategy. *Oppose M&A* category includes events where the hedge fund is opposing a pending M&A deal. Categories are not mutually exclusive so one event can appear in more than one category. In each regression, the dependent variable is a dummy variable that equals one for firms that were subject to 13D filings by activist hedge funds and zero otherwise. Independent variable *Net-of-market return* is the one year unadjusted return prior to the 13D filing year less same period return on S&P 500 index; *Free cash flow* is earnings before depreciation and amortisation less tax, interest, dividends and share repurchases divided by total assets; *Cash ratio* is the cash and marketable securities divided by total assets; *Debt ratio* is the total debt divided by total assets; *Sales growth* is the average geometric growth rate in firm's sales for a two year period before the 13D filing year; *Diversification* is the number of business segments for which a firm reports four-digit SIC code; *Tobin's q* is the sum of market value of equity and book value of debt divided by the book value of assets; *Industry q* is the median Tobin's *q* of firms in the same Fama-French 48 industry; *Abnormal q* is the percentage difference between Tobin's *q* and industry *q*; *Insider ownership* is the percentage of closely held shares as reported by Thomson Financial; *Institutional ownership* is the percentage of shares held by institutional investors as reported by Thomson Financial; *ln(market capitalisation)*is the natural logarithm of year end market capitalisation; *R&D dummy* is a dummy variable that equals one if the firm reported R&D expenditures, and zero otherwise; *Liquidity* is the mean yearly share turnover of a firm's stock; *SIC dummies* are dummy variables that represent the ten one-digit SIC codes; *Year dummies* are dummy variables that represent the individual years. All variables are calculated as of the year end before the 13D filing. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at the 1%, 5%, and 10% levels, respectively.

		Dependent variable: 1 if target, 0 otherwise					
Independent variables	Expected sign	General	Corporate governance	Demand Sale	Capital structure	Strategy	Oppose M&A
Net-of-market return	-	-0.0410	-0.1058	-0.4088 *	0.3427	-0.9112 ***	0.6666
		(-0.32)	(-0.49)	(-1.60)	(1.21)	(-2.72)	(1.54)
Free cash flow	+	1.3408 ***	-0.2612	3.3349 ***	0.8740	2.8498 **	2.9162 *
		(2.45)	(-0.38)	(2.73)	(0.66)	(1.81)	(1.30)
Cash ratio	+	0.0954	0.5550	0.7987	1.2606 *	1.8956 **	2.9845 ***
		(0.24)	(0.84)	(1.00)	(1.43)	(1.70)	(2.32)
Debt ratio	-	-0.2850	0.4628	-0.2137	0.4170	0.8270	1.8900
		(-0.71)	(0.71)	(-0.26)	(0.48)	(0.71)	(1.47)
Sales growth	-	-0.5057 **	-1.4155 ***	-1.7067 ***	-0.7087	-1.4879 **	-1.1996
		(-2.16)	(-2.83)	(-2.65)	(-1.19)	(-1.67)	(-1.16)
Diversification	+	0.0461	0.0297	0.0021	0.0873	-0.0729	-0.1070
		(1.08)	(0.39)	(0.02)	(0.92)	(-0.53)	(0.67)
Industry q	-	-0.3462 **	-0.7120 **	-1.3334 **	-1.1537 **	-1.1444 *	-0.9945 **
		(-1.91)	(-2.18)	(-2.69)	(-2.30)	(-1.31)	(-1.66)
Abnormal q	-	-0.6366 ***	-1.3527 ***	-1.1679 ***	-1.3403 ***	-1.2361 **	-1.8640 ***
		(-4.17)	(-3.66)	(-2.99)	(-2.90)	(-2.06)	(-2.43)
Insider ownership	-	-0.0065 **	-0.0101 **	-0.0154 **	-0.0088	-0.0175 **	-0.0117
		(-2.05)	(-1.81)	(-2.26)	(-1.25)	(-1.65)	(-1.01)
ln (market capitalisation)	-	-0.0914 ***	-0.1015 *	-0.0458	-0.1087	0.0276	0.0290
		(-2.45)	(-1.50)	(-0.60)	(-1.25)	(0.24)	(0.22)
R&D dummy	-	-0.0670	-0.3044	0.1549	-0.3508	-0.1060	0.7946
		(-0.41)	(-1.08)	(0.47)	(-0.94)	(-0.19)	(1.29)
Liquidity	+	-0.0159	-0.0425	0.0006	0.0001	0.0164	0.0010
		(-0.49)	(-0.60)	(0.15)	(0.01)	(0.31)	(0.32)
Intercept		-3.7252 ***	-5.9238 ***	-3.7441 ***	-3.6577 ***	-5.4456 ***	-6.7968 ***
		(-6.61)	(-4.98)	(-3.03)	(-2.96)	(-3.24)	(-3.68)
SIC dummies		yes	yes	yes	yes	yes	yes
Year dummies		yes	yes	yes	yes	yes	yes
Number of observations		17 259	17 259	17 259	17 259	17 259	17 259
thereof targets		*281*	*90*	*67*	*53*	*29*	*22*
thereof nontargets		*16 978*	*17 169*	*17 192*	*17 206*	*17 230*	*17 237*
χ^2		176.79	104.94	90.63	63.19	47.21	32.91
(p-value)		(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.063)
Pseudo R^2		0.0616	0.0934	0.1035	0.0881	0.1148	0.1007

Corporate governance

The second column of Table 10 shows logistic regression estimates for the subsample of 90 corporate governance related activism events and control firms. This category included events where activist hedge funds demanded board seats, the CEO to be fired, or other mostly takeover defence related changes. The most interesting result obtained from this regression is the fact that the likelihood of corporate governance related activism is decreasing with free cash flow, indicating that activist hedge funds are more likely to demand managerial changes in firms that are underperforming in terms of accounting performance. Even though the free cash flow does not enter the model with any significance, it receives a negative sign only in the case of corporate governance related activism. This supports the finding in Section 5.1 showing that firms targeted with corporate governance related proposals have negative free cash flow which is significantly lower compared to targets of other types of activism. The descriptive statistics also show that firms targeted with corporate governance proposals have experienced significantly lower sales growth in two years prior to targeting. Although the coefficient for sales growth is negative and highly significant, the results do not differ markedly when compared to the determinants of other types of activism. Similarly, the coefficients for other variables follow similar pattern and significance when compared to full sample and other types of activism, with the exception that the coefficient for market capitalisation is only significant at 10% level, indicating that size does not play that important role as it does in general.

Demand sale

One of the most radical requests set out by activist hedge funds in the 13D filings is the demand to sell the whole company or particular assets to the highest bidder. Column 3 of Table 10 shows estimated logistic regression coefficients for the subsample of 67 targets that were subject to such proposals. As shown in Table 10, the probability of being targeted with the intention of putting the company for sale decreases significantly in abnormal q and industry q. However, this result does not differ from the full sample regression estimates. Furthermore, the coefficients for free cash flow, sales growth, and insider ownership generally follow a similar pattern as the coefficients for the full sample in Table 8. However, in contrast to the pooled data, the likelihood of being targeted with sale and divestiture proposals is significantly negatively related to prior performance. The coefficient for net-of-market is significant at 10% level. This is consistent with Manne (1965) who argues that

acquisitions occur in response to poor performance by incumbent managers. When activist hedge funds demand a sale of the company it implicitly suggests that the incumbent managers are to blame for the poor performance. Furthermore, even though sale and divestiture proposal targets are roughly of equal size with other targets, market capitalisation does not generally affect their targeting probability as it does for targets in general.

Capital structure

In the case where the activist hedge fund is proposing changes to capital structure, one would expect such variables as cash ratio and debt ratio to figure more prominently in target selection process when compared to other types of activism. Therefore, I estimate logistic regressions for the subsample of 53 activist hedge fund targets that were subject to a 13D filing whose purpose was to change the target firm's capital structure through a share repurchase, dividend payment, or leveraged recapitalisation. The control group is the same as in earlier regressions. The results are presented in column 4 of Table 10. As shown in column 4 of Table 10, the likelihood of becoming subject to capital structure proposals by activist hedge funds depends on somewhat different factors when compared to targets in general. Most importantly, firms who hold more cash in their balance sheet are significantly more likely to be targeted with capital structure proposals, as suggested by the positive and significant coefficients for cash ratio. Another notable difference is the positive, although not significant, coefficient for net-of-market return, suggesting that the likelihood of targeting increases rather than decreases with prior performance in the case of capital structure proposals. This result is in line with Jensen's (1986) argument according to which firms with substantial free cash flow and cash reserves have done exceptionally well in the past. Table 10 also shows that the probability of receiving capital structure proposals is significantly decreasing in abnormal q and industry q, a result that is in line with previous analysis. Furthermore, in contrast to earlier regression, sales growth, diversification, insider ownership and market capitalisation do not have very robust effects on the probability of receiving capital structure proposals.

Strategy

The fifth column of Table 10 shows logistic regression estimates for the subsample of 29 firms that were targeted in an attempt to influence strategic and operational changes at target firms and control firms. As shown in column 5 of Table 10, the likelihood of becoming a subject to proposals that demand strategic changes at target companies is significantly

negatively related to prior performance. The coefficient for net-of-market return is negative and significant at 1% level. The value of the coefficient is also substantially lower in this regression than others, indicating that prior performance is a decisive factor in determining the probability of this type of activism. This is also evident from the univariate analysis, which shows that firms subject to strategy related activism significantly underperform the market by 25% in the previous year. For comparison, the mean net-of-market return is only -3% for the full sample. This result is in line with Manne's (1965) theory. Another notable difference is the positive and significant coefficient for cash ratio. When considering other variables, the significance of coefficients for abnormal *q* and industry *q* are only significant at 5% level, indicating that undervaluation does not play that important role in the case of strategy related proposals. What is more, the coefficient for size is positive, indicating that size does not deter strategy related activism.

Oppose M&A

I also estimate logistic regressions for the subsample of 22 activist hedge fund targets that were subject to a 13D filing whose purpose was to oppose pending M&A deals. The control group is the same as in earlier regressions. The results are presented in the sixth column of Table 10. It should be noted that as a whole the model suffers from lack of significance, which can be explained with low number of observations for this category. Most interesting result of the regression in column six of Table 10 is the positive coefficient for the net-of-market return variable. The coefficient t-statistic is also quite high, but still insignificantly different from zero. The most plausible explanation is that net-of-market return variable for this activism type is affected by the pending M&A deal and corresponding premium in case if the firm is a target of a takeover bid. Indeed, univariate results show that oppose M&A category target firms overperform the market in the year prior to targeting. Second noteworthy aspect is that the probability of this type of activism is significantly positively related to cash ratio, as indicated by the 1% significance level. It is commonly suggested that corporate acquirers are tempted by the targets excessive cash holdings because disgorging excess cash provides a rather easy profit opportunity. Acknowledging this, activist hedge funds may be motivated to purchase shares in the target and block the acquisition so as to be part of this profit opportunity by pressuring managers of the target to pay the cash out themselves. Considering other variables, abnormal *q* and industry *q* are again significantly negatively related to targeting probability, with no notable differences compared to other

categories. Interestingly, size obtains a positive coefficient in this regression, but it is not significantly different from zero.

Overall, the results in Table 10 suggest that the same probability model does not apply for all activism types. For example, the hypothesis that poorly performing firms are more likely to be targeted is valid in general, corporate governance, demand sale, and strategy categories, but fails to gain any support in the capital structure and oppose M&A categories. Indeed, it seems that the opposite is true for latter categories as suggested by the positive coefficients for net-of-market return. The explanation with regard to the oppose M&A category is obvious: the pending M&A deal that the hedge fund is opposing is probably affecting the returns. In the case of capital structure activism, Jensen's (1986) hypothesis that firms with substantial amounts of excess cash have performed exceptionally well in the past may provide a plausible explanation.

Table 10 also provides some interesting results with respect to the free cash flow hypothesis. The regression coefficients for free cash flow are positive for all categories expect for corporate governance related activism where the coefficient is negative. This suggests that while majority of hedge fund activism events are driven by the motive to reduce agency problems the free cash flow hypothesis does not universally explain the occurrence of hedge fund activism. Indeed, the demands by activist hedge funds to fire CEOs, for example, may be driven by the fact that they are incompetent rather than entrenched. While higher cash ratio significantly increases targeting probability in case of capital structure, strategy, and M&A related activism, the same cannot be said for general, corporate governance, and demand sale categories. However, the coefficients for cash ratio are positive throughout Table 10 indicating that excess cash plays at least a minor role in the decisions of activist hedge funds to engage in activism.

Another noteworthy aspect of Table 10 is the fact that diversification fails to gain any significance in predicting hedge fund activism likelihood. However, as shown in Tables 8 and 9 diversification entered the model with significance only in cases where the regressions did not control for Tobin's q suggesting that Tobin's q, industry q, and abnormal q may be capturing all its effects. This is plausible given the empirical evidence suggesting that the excessive diversification may result in undervaluation (see, e.g. Berger and Ofek 1995). As also shown in Table 10, insider ownership takes expected sings in every regression. It fails to gain significance in capital structure and oppose M&A regression models, but this may be

explained with the low number of observations for these categories. With regard to ln(market capitalisation) the results are somewhat more interesting. Size seems to significantly deter hedge fund activism only general and capital structure categories. Again, this may arise from the fact that these categories are those with the most observations. In demand sale and capital structure categories, ln(market capitalisation) obtains expected signs but fails the significance tests. In contrast, it has positive coefficient in the strategy and oppose M&A categories, but the t-statistics are extremely low.

Although there is some variation in the pattern of coefficients between different types of activism, two variables stand out from Table 10 as consistently obtaining significant coefficients with expected signs. Most importantly, the likelihood of hedge fund activism is significantly negatively related to abnormal q in all activism types, suggesting that undervaluation plays a very important in determining targeting probability. This is consistent with the hypothesis that activist hedge funds consistently seek undervalued targets. What is more, the probability of becoming a target is significantly negatively related to industry q in every category of activism. Together, these results suggest that activist hedge finds are more likely to target undervalued firms in undervalued or underperforming industries

5.2 Shareholder gains

This section investigates whether hedge fund activism creates shareholder value. Specifically, I do this by examining the cumulative abnormal returns to target firm shareholders around the initial 13D filing date. Positive cumulative abnormal returns around the 13D filing would indicate that hedge fund activism increases shareholder value. Insignificant returns would in turn be consistent with activism having no effect or a mixed effect – positive and negative. Finally, negative returns would indicate that hedge fund activism disturbs managers and has a detrimental effect on firm value.

5.2.1 Cumulative abnormal returns

Table 11 reports daily abnormal returns (AR) for the 470 13D filings during a 101-day event window extending from 50 days before through 50 after the initial 13D filing date, which is the first public announcement date of the activist hedge fund's ownership exceeding 5% of the firm's outstanding equity. Table 11 also presents the cumulative abnormal returns (CAR) for days from 50 days before through 50 days after the 13D filing. Two-tailed t-statistics is also provided for both ARs and CARs. I do not mark t-statistics for CARs with stars due to

the fact that all CARs are significant at 1% level after day -10. Furthermore, the third and sixth columns of the table report the proportions of positive ARs and CARs on a given day, respectively. The CAR over the same period is also plotted in Figure 1. Figure 1 also includes CARs for the sample that includes the otherwise omitted financial firms to ensure robustness of results.

Table 11: Abnormal returns around 13D filing date

The table reports mean daily abnormal returns (AR) and cumulative mean daily abnormal returns (CAR) for 470 firm that were subject to 13D filing by activist hedge funds in 2000-2006 from 50 days before through 50 days after the initial 13D filing. The table also reports the percentage of positive ARs and CARs. The abnormal return is calculated based on the market model parameters estimated days of -300 to -51 using S&P500 as the market proxy. "T-stat" reports the test statistics of a two-tailed t-test for the null hypothesis of zero abnormal return. For each day, ***, **, and *, indicate that the AR is different from zero at the 1%, 5%, and 10% levels, respectively.

	AR			CAR		
Event day	Mean	t-stat	% Positive	Mean	t-stat	% Positive
-50	0.08%	0.493	47.63%	0.08%	0.493	48.83%
-40	-0.10%	-0.783	46.15%	0.06%	0.121	50.74%
-30	-0.06%	-0.226	48.45%	-0.87%	-1.136	49.68%
-20	0.41%	2.177 **	52.33%	0.41%	0.434	51.80%
-15	0.13%	0.529	48.94%	0.99%	0.946	50.32%
-14	-0.21%	-1.423	45.76%	0.78%	0.724	50.53%
-13	0.32%	1.661 *	50.00%	1.09%	0.998	51.59%
-12	0.31%	1.207	49.15%	1.41%	1.235	52.23%
-11	0.38%	2.257 **	48.73%	1.78%	1.571	52.44%
-10	0.45%	2.584 ***	51.27%	2.23%	1.978	52.65%
-9	0.16%	1.274	50.21%	2.39%	2.091	52.87%
-8	0.15%	0.748	48.31%	2.54%	2.184	54.56%
-7	0.67%	3.163 ***	49.58%	3.20%	2.693	56.05%
-6	0.37%	2.434 **	52.75%	3.58%	3.029	56.69%
-5	0.39%	2.587 ***	54.66%	3.97%	3.308	55.63%
-4	0.32%	2.465 **	52.97%	4.29%	3.572	57.54%
-3	0.17%	1.050	47.88%	4.46%	3.689	57.54%
-2	0.47%	2.482 **	52.33%	4.94%	4.028	57.32%
-1	0.31%	2.243 **	52.12%	5.25%	4.295	58.17%
13D filing date	**0.92%**	**4.675** ***	**55.93%**	**6.16%**	**5.064**	**60.51%**
1	0.58%	3.569 ***	54.66%	6.75%	5.521	61.36%
2	0.35%	2.458 **	51.91%	7.09%	5.771	62.21%
3	0.07%	0.522	46.82%	7.17%	5.781	60.72%
4	-0.08%	-0.630	46.61%	7.08%	5.675	61.36%
5	0.27%	1.725 *	53.81%	7.35%	5.827	60.72%
6	0.30%	2.162 **	51.69%	7.65%	6.042	61.36%
7	0.43%	3.287 ***	52.33%	8.07%	6.305	62.42%
8	-0.07%	-0.526	47.03%	8.00%	6.296	61.57%
9	-0.09%	-0.783	49.79%	7.91%	6.174	60.51%
10	-0.06%	-0.482	46.19%	7.85%	6.030	60.08%
11	0.21%	1.622	49.36%	8.06%	6.143	60.93%
12	0.00%	0.024	47.88%	8.06%	6.136	61.15%
13	0.23%	1.911 *	52.97%	8.28%	6.261	61.36%
14	-0.23%	-1.775 *	46.61%	8.06%	6.029	60.93%
15	0.24%	1.871 *	49.79%	8.29%	6.144	60.08%
20	0.26%	1.425	49.36%	8.12%	5.818	60.93%
30	0.33%	2.321 ***	50.91%	8.77%	5.903	62.00%
40	0.20%	1.631	48.74%	9.07%	5.724	58.81%
50	-0.03%	-0.302	44.50%	9.23%	5.535	59.02%

Table 11 shows that the ARs for target firms begin accumulating well before the 13D filing date. It should be reiterated here that activist hedge funds must file the schedule 13D 10 days after exceeding the 5% ownership threshold. During the 10 day period, they can they can increase their holdings as much as they like and they have strong incentives to do so. By holding more shares they represent a more credible threat to the incumbents and are more likely to succeed. The 10 day period also mitigates the free-rider problem as they can increase their stake while the public is oblivious of their plans. Indeed, we observe the first cluster of significantly positive ARs on days -13, -11, and -10, slightly before the 10 day period, suggesting that the run-up may be caused by the hedge fund accumulating its 5% stake. We also observe a significantly positive run-up between days -7 and 0 with the exception of day -3 when the AR is not significantly different from zero. In total, the run-up in returns from 50 days before through 1 day before the 13D filing date is 5.25%, which is considerably higher than 1.8% reported by Brav et al. (2006) but seems to be in line with that reported by Klein and Zur (2006) who do not report exact figures. The evidence is consistent with existing takeover literature, which accounts this run-up in the target's share price to illegal insider trading or media rumours and pre-announcement share purchases by the eventual acquirer (see, e.g. Keown and Pinkerton 1981, Jarrell and Poulsen 1989, and Meulbroek 1992).

On the 13D filing date, hedge fund activist targets experience a significantly positive abnormal return of 0.92%. The returns remain significantly positive for the two following days, averaging 0.58% and 0.35% on days 1 and 2, respectively. The [0, 2] cumulative abnormal return of 1.85% is of similar magnitude that the 2.3% obtained by Brav et al. (2006) for the same period.

Overall, target firm shareholders gain on average 9.23% during the event window suggesting that hedge fund activism does create shareholder value. The CAR is significantly positive already from day -10 onwards. CAR reaches 6.16% at the 13D filing date and drifts about 3% upwards to 9.23% by day 50. The finding that over 60% of targets experience positive CARs during the 101 day event window lends further support for the hypothesis that hedge fund activism is value increasing. When a [-20, 20] window is used, the total CAR is 8.10% and the fraction of firms that earn positive returns is 65%. These results are somewhat higher than those obtained by Brav et al. (2006) who report a CAR of 6.8% during an event windows of [-20, 20] days even though they use a smaller sample from a shorter period of time. Klein and Zur (2006) show that targets earn a return of 10.3% during a [-30, 30] day event window, but the higher returns can be attributed to the fact that they calculate only raw returns.

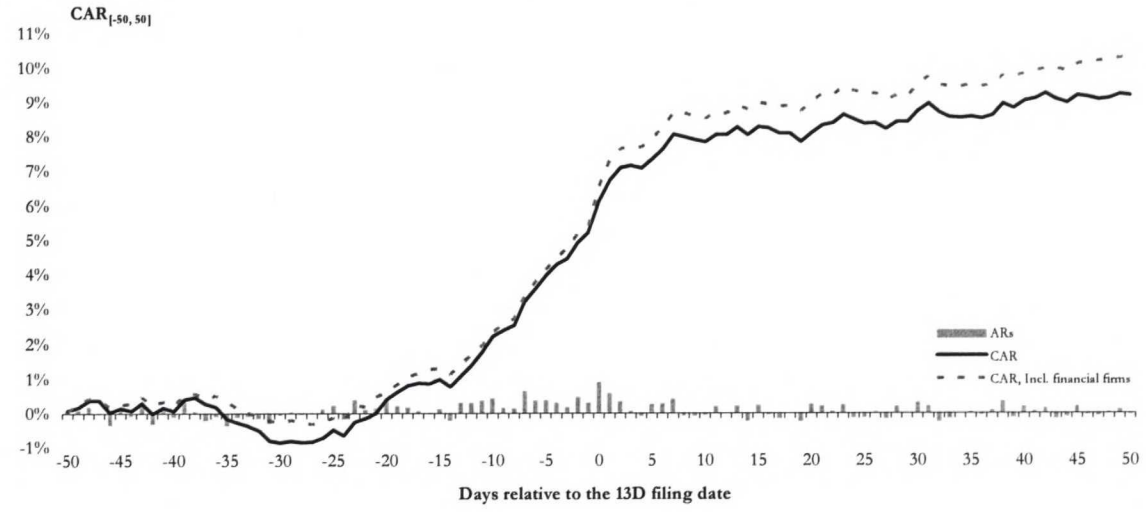
Another explanation for the positive abnormal returns around the 13D filing date is that activist hedge funds provide a credible mechanism for signalling information to other investors. According to Chidambaram and John (1998), large institutional investors can convey private information that they obtain as a by-product of monitoring to other shareholders. Under this hypothesis, the 13D filing by an activist hedge fund conveys favourable information, such as undervaluation, to markets, which then results in an increase in share price. In this case, activist hedge funds do not improve firm performance per se, but let the market know that the firm is doing better than the market currently believes. The positive abnormal returns accompanied with strong evidence from logit regressions that activist hedge funds target undervalued firms are consistent with this hypothesis.

Alternative explanation for positive abnormal returns around the event date could be an increase in demand for the shares of the target firm. If the excess supply curve of the target's shares is upward sloping, new demand could only be met at higher prices (see, e.g. Scholes 1972, Mikkelson and Parcth 1985). The significantly positive abnormal returns before the 10-day period are consistent with the increased demand hypothesis. However, the fact that we observe significantly positive abnormal returns on the 13D filing date, and after, is inconsistent with the hypothesis that increased demand is the sole cause of abnormal returns.

As a conclusion, the positive abnormal returns associated with 13D filings by activist hedge funds are consistent with the hypothesis that activist hedge funds can curb moral hazard and improve performance as well as with the undervaluation hypothesis. Investors seem to believe that activist hedge funds either improve firm performance or consistently target undervalued firms, which in turn results in a higher share price. I also present some evidence in support of the increased demand hypothesis, but this effect seems to play only a minor role in explaining share price increases associated with hedge fund activism.

Figure 1: Cumulative abnormal returns around 13D filing date

The figure shows mean daily abnormal returns (AR) cumulative abnormal returns (CAR) for 470 firm that were subject to 13D filing by activist hedge funds in 2000-2006 from 50 days before through 50 days after the initial 13D filing. I also include the CARs for the sample that includes financial firms as a robustness check. The abnormal return is calculated based on the market model parameters estimated days of -300 to -51 using S&P500 as the market proxy. The x-axis is the day relative to the 13D filing date. The y-axis is the cumulative abnormal return.



5.2.2 Cumulative abnormal returns by year

Given the substantial increase in the number of firms targeted by activist hedge funds from 2000 to 2006 accompanied with the dramatic increase in the number of hedge funds pursuing activist strategy, examination of cumulative abnormal returns associated with hedge fund activism by targeting year is in order. The expectation is that returns from activism should decline due to diminishing returns and competition between activist hedge funds. This reasoning parallels the arguments of Bradley et al. (1988) according to which the best opportunities in the corporate acquisition market are taken first resulting in diminishing returns over time.

Table 12: Cumulative abnormal returns by year

The table reports mean cumulative abnormal returns on different event windows for 470 firm that were subject to 13D filings by activist hedge funds in 2000-2006 by 13D filing year along with the number of observations for each year. The table also reports the F-test statistics and corresponding p-values for difference in means between years. Panel A reports cumulative abnormal returns before the 13D filing date (day 0), Panel B around the 13D filing date, and Panel C after the 13D filing date. The abnormal return is calculated based on the market model parameters estimated days of -300 to -51 using S&P500 as the market proxy. For each mean cumulative abnormal return, ***, **, and * indicate that the value is different from zero at 1%, 5%, and 10% levels, respectively. Symbols, [a],[b], and [c] indicate that the mean CAR for particular event window differs between years at the 1%, 5%, and 10% levels, respectively.

	Mean cumulative abnormal return by 13D filing year							Difference test	
Event window	2000	2001	2002	2003	2004	2005	2006	F-stat	Prob > F
Panel A: Cumulative abnormal returns before 13D filing date									
$CAR_{[-50, -1]}$	5.70%	9.53%	2.88%	12.83% ***	2.89%	5.42% **	2.32%	1.47	0.187
$CAR_{[-20, -1]}$	6.56% **	6.78%	8.54% ***	10.63% ***	3.61% ***	3.30% **	3.78% ***	2.21 [b]	0.0409
Panel B: Cumulative abnormal returns around 13D filing date									
13D filing date	0.27%	3.04% **	-0.22%	0.34%	0.60%	1.48% ***	0.94% ***	2.17 [b]	0.0443
$CAR_{[-2, 2]}$	4.00% **	3.98% **	0.37%	2.91% ***	2.10% ***	3.41% ***	2.28% ***	1.14	0.3355
$CAR_{[-20, 20]}$	11.83% ***	13.45% *	9.46% **	15.29% ***	5.36% **	6.40% ***	5.59% ***	2.6 [a]	0.00172
$CAR_{[-50, 50]}$	19.27% **	24.25% **	5.80%	22.83% ***	4.33%	7.84% ***	2.59%	3.82 [a]	0.001
Panel C: Cumulative abnormal returns after 13D filing date									
$CAR_{[1, 20]}$	5.00%	3.63%	1.13%	4.32% ***	1.15%	1.63% **	0.88%	1.25	0.2777
$CAR_{[1, 50]}$	13.30% **	11.68% **	3.13%	9.66% ***	0.84%	0.94%	-0.68%	5.45 [a]	0.000
Number of observations	22	26	33	68	88	108	125		

Table 12 present the cross-section of cumulative abnormal returns for different event windows according to the year of targeting. The CARs from 50 days before through 50 days after the 13D filing for each year are also plotted in Figure 2. Panel A of Table 12 reports cumulative returns for periods of 50 and 20 days prior to the 13D filing. The results show that 13D filings are preceded by positive abnormal returns in every year. The magnitude of these returns is somewhat different from year to year, but there are no substantial differences that would warrant further analysis.

As shown in the Panel B of Table 12, the pattern of cumulative abnormal returns around different event windows lends support for the diminishing returns hypothesis. For event windows [-20, 20] and [-50, 50], the CARs are significantly higher in years 2000-2003 than in 2004-2006. In 2000, 2001, and 2003 the $CAR_{[-50, 50]}$ are in the 20% region and highly significant, while returns in 2002, 2004, 2005, and 2006 all below 10% and generally insignificantly different from zero, with $CAR_{[-50, 50]}$ for 2005 being the exception. The high F-stats for the $CAR_{[-50, 50]}$ and $CAR_{[-20, 20]}$ regressions indicate that the differences are statistically significant at 1% level. These results suggest that returns from hedge fund

activism have decreased over time, consistent with the finding of Bradley et al. (2006) that closed-end fund discount shrinks in anticipation of the open-ending attempts from hedge funds.

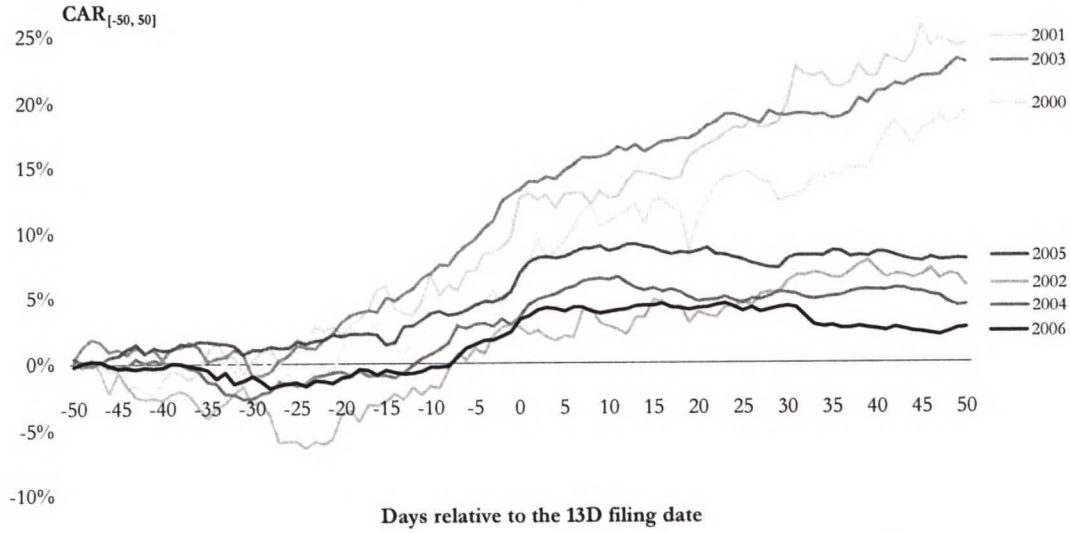
The picture is less clear when looking at CARs on shorter event windows that do not seem to diminish over time. The pattern of shorter event window CARs may be explained by increased interest in hedge fund activism by the financial press and investors in general. Interest in hedge fund activism has surely increased in recent years. For example, a search for U.S. news in Lexis Nexis database using words "hedge fund" and "activism" or "activist" by year produces 764, 403, 144, 112, 93, 62, and 94 hits for years 2006-2000, respectively. Furthermore, some investors are increasingly trying to benefit from hedge fund activism by buying shares in firms that are subject to 13D filings. There are even services that track 13D filings on the behalf of investors. This should result in the following pattern of returns: short term returns should be relatively high as increased demand pushes up prices right after the 13D filing date thereby decreasing the post announcement drift in returns – that is, the markets should become more efficient. The returns at 13D filing date and during the [-2, 2] day window seem to support this hypothesis as more recent returns are more significant.

Furthermore, as shown in Panel C of Table 12, the post-announcement returns are significantly lower in 2004-2006 compared to 2000-2003. This has important implications to investors who are trying to mimic activist hedge funds. While the strategy of buying shares in firms subject to 13D filings at the end of day 0 has earned an average return of 3.04% in 50 days, these returns have been significantly lower in 2004-2006 compared to 2000-2003. Indeed, in 2004-2006, the post 13D filing cumulative abnormal returns do not differ significantly from zero, suggesting that the entire effect of hedge fund activism on firm value is already in the share price at the end of the 13D filing day. In contrast, the returns in 2000, 2001, and 2003 are positive and significant, indicating that investors tracking activist hedge fund purchases have been able to make abnormal gains.

Figure 2 and Figure 3 plot the cumulative abnormal returns by targeting year. Figure 2 plots mean daily abnormal returns from 50 days before through 50 days after the 13D filing date. Figure 3, on the other hand, plots aggregate mean CARs for 101, 41, and 5-day periods surrounding the 13D filing date. Figure 2 shows that the returns have declined significantly over time. Returns in 2000, 2001, and 2003 seem to be markedly higher than returns in 2002, 2004, 2005, and 2006.

Figure 2: Cumulative abnormal returns for 101-day period around the 13D filing date by year

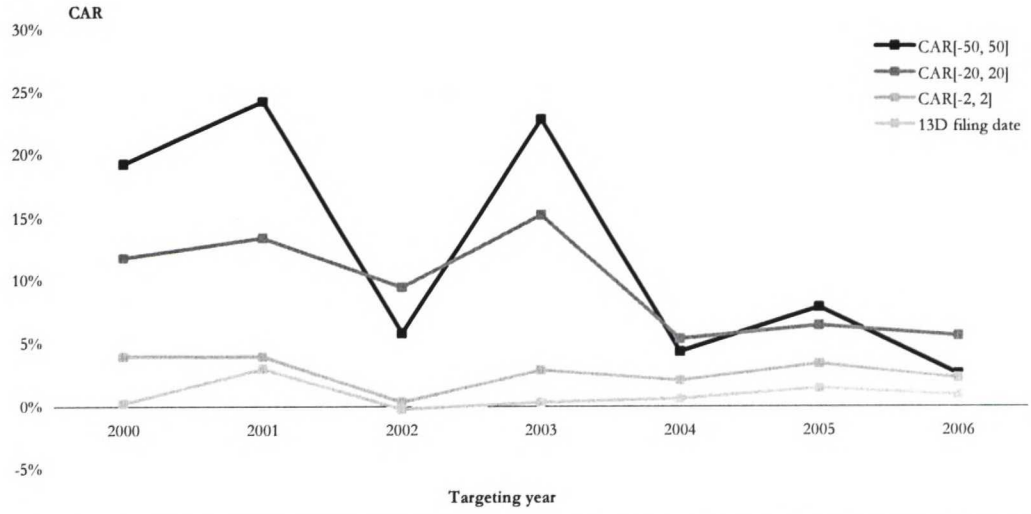
The figure plots mean cumulative abnormal returns from 50 days before through 50 days after the 13D filing date for 470 firm that were subject to 13D filings by activist hedge funds in 2000-2006 by 13D filing year. The abnormal return is calculated based on the market model parameters estimated days of -300 to -51 using S&P500 as the market proxy. The x-axis is the day relative to the initial 13D filing date (day 0). The y-axis is the cumulative abnormal returns from 50 days before through 50 days after the 13D filing date.



As a robustness check, Figure 3 plots cumulative abnormal returns for different holding periods by targeting year. As shown in Figure 3, CARs for 101 and 41-day event windows appear to decline over time with the exception that CARs are exceptionally low in 2002. The decline is not so evident from the 5-day event window CARs, but there still seem to be a slight decline in returns towards 2006.

Figure 3: CAR $_{[-50, 50]}$, CAR $_{[-20, 20]}$, CAR $_{[-2, 2]}$ and 13D filing date returns by year

The figure plots mean cumulative abnormal returns from 50, 20, and 2 days before through 50, 20, and 2 days after the 13D filing date for 470 firm that were subject to 13D filings by activist hedge funds in 2000-2006 by 13D filing year. The abnormal return is calculated based on the market model parameters estimated days of -300 to -51 using S&P500 as the market proxy. The x-axis is the day relative to the initial 13D filing date (day 0). The y-axis is the cumulative abnormal returns from 50 days before through 50 days after the 13D filing date.



5.2.3 Cumulative abnormal returns by activism type

Given the considerable heterogeneity in activist hedge fund demands at target companies, I also analyse the cross-section of cumulative abnormal returns by type of activism. As explained in Section 4.2.2, I divided hedge fund activism events into seven categories according to the type of demands set out in the Item 4 of the Schedule 13D for the target firm. Because the categories are not mutually exclusive, calculating simple means would not give the right picture of returns associated with each category. Therefore, I estimate OLS regressions that show how the CARs for different event windows correlate with the dummy variables corresponding to the 7 categories of activism type. The intercept is suppressed to zero to obtain coefficients that can be interpreted as mean abnormal returns for a particular category. The results are reported in Table 13.

The general category includes all events where the hedge funds do not specify any demands; rather they state a general demand to increase shareholder value. The corporate governance category includes all events related to firing CEOs, changing board composition, or rescinding takeover defences. The demand sale category includes events where the hedge funds demand a sale of the target company, or some of its assets, to a third party (in most cases) or to themselves. Capital structure category relates to demands with respect to disgorging excess cash through dividends, share repurchases, or leveraged recapitalisations. The strategy category includes events where the hedge fund's aim is to change the target

firm's operating strategy. The oppose merger category includes all events where the hedge fund is opposing a pending M&A deal; either demanding a higher price for their shares or discouraging the target firm to go ahead with a planned acquisition. Finally, the financing category takes all events where a hedge fund is willing to extend financing to the target firm to implement growth strategies or help it in financial distress.

Table 13: Cumulative abnormal returns by activism type (OLS regressions with suppressed constant)

The table reports regression coefficients and corresponding t-statistics (in parentheses under each coefficient) for OLS regressions on cumulative abnormal returns for 470 firm that were subject to 13D filing by activist hedge funds in 2000-2006 using activism type dummies as independent variables. The table also reports model F-statistics and corresponding p-values. Activism type dummies represent the seven different categories of activist hedge fund demands at target firms: general, corporate governance, demand sale, capital structure, strategy, oppose M&A, and financing. Categories are not mutually exclusive. The constant term is suppressed to zero to obtain coefficient values that can be interpreted as mean abnormal returns for a particular category. Panel A reports cumulative abnormal returns before the 13D filing date (day 0), Panel B around the 13D filing date, and Panel C after the 13D filing date. The abnormal return is calculated based on the market model parameters estimated days of -300 to -51 using S&P500 as the market proxy. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at the 1%, 5%, and 10% levels, respectively. Symbols, [a,b], and [c] indicate that the coefficients for each regression are different from each other at the 1%, 5%, and 10% levels, respectively.

	Independent variables: Activism type dummies								
Dependent variable	General	Corporate governance	Demand sale	Capital structure	Strategy	Oppose merger	Financing	F-stat	Prob > F
Panel A: Cumulative abnormal returns before 13D filing date									
$CAR_{[-50, -1]}$	4.69%***	3.90%	1.99%	1.73%	2.17%	9.80%*	30.88%	3.3[a]	0.002
	(3.03)	(1.34)	(0.58)	(0.45)	(0.43)	(1.84)	(1.63)		
$CAR_{[-20, -1]}$	4.38%***	4.01%**	3.15%	0.35%	2.95%	9.12%***	20.26%*	7.91[a]	0.000
	(4.69)	(2.28)	(1.52)	(0.15)	(0.96)	(2.84)	(1.77)		
Panel B: Cumulative abnormal returns around 13D filing date									
13D filing date	0.43%*	0.37%	2.41%***	0.02%	0.25%	1.02%	3.24%	5.08[a]	0.000
	(1.75)	(0.79)	(4.41)	(0.03)	(0.31)	(1.18)	(1.07)		
$CAR_{[-2, 2]}$	1.55%***	2.50%***	5.86%***	-0.95%	0.54%	1.81%	-8.25%	14.98[a]	0.000
	(3.73)	(3.18)	(6.34)	(-0.91)	(0.39)	(1.24)	(-1.61)		
$CAR_{[-20, 20]}$	6.61%***	6.99%***	7.86%***	-3.85%	5.88%	10.26%**	32.30%**	12.7[a]	0.000
	(5.57)	(3.12)	(2.98)	(-1.29)	(1.50)	(2.46)	(2.21)		
$CAR_{[-50, 50]}$	7.74%***	8.40%**	8.66%*	-5.90%	9.05%	14.10%**	36.03%	5.28[a]	0.000
	(3.67)	(2.12)	(1.86)	(-1.12)	(1.30)	(1.91)	(1.39)		
Panel C: Cumulative abnormal returns after 13D filing date									
$CAR_{[1, 20]}$	1.88%***	2.58%**	2.30%*	-4.27%***	2.70%	1.05%	8.78%	3.74[a]	0.001
	(2.98)	(2.17)	(1.65)	(-2.70)	(1.30)	(0.48)	(1.13)		
$CAR_{[1, 50]}$	2.72%***	4.13%**	4.27%*	-7.67%***	6.62%*	2.71%	1.90%	3.86[a]	0.000
	(2.65)	(2.13)	(1.87)	(-2.97)	(1.95)	(0.77)	(0.15)		
Number of observations	305	103	72	58	31	24	2		

The data exhibited in Table 13 suggests that there are substantial differences in returns between the activism type categories. With regard to $CAR_{[-20, 20]}$ and $CAR_{[-50, 50]}$, activism that opposes pending M&A deals yields the highest abnormal returns of 10.26% and 14.10%, respectively. This is reasonable because pending M&A deals may not go through without the support of the hedge fund's at least 5% stake, giving them a strong bargaining position against possible acquirers. The short event window abnormal returns for this type of activism are also positive, yet insignificant. However, closer examination of abnormal returns in this category

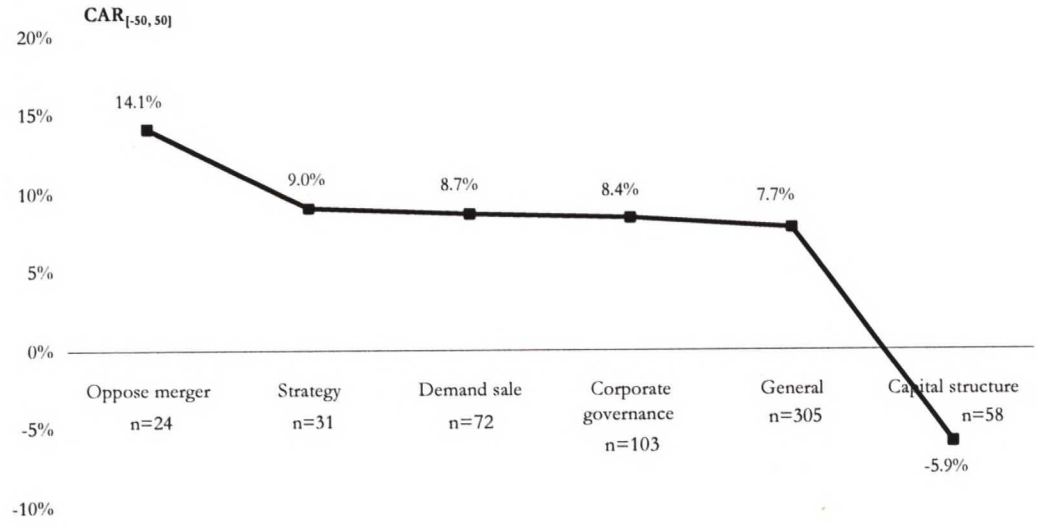
shows that a bulk of these returns accrue in the pre-13D filing period, suggesting that the pending M&A deal itself may account for most of the returns. Indeed, the cumulative abnormal returns preceding the 13D filing date are positive and highly significant (Panel A) while the returns after the 13D filing are not significantly different from zero (Panel B). This finding casts doubt on whether target firm shareholders gain from this type of activism. Nevertheless, the results reported herein are consistent with those of Brav et al. (2006), with the exception that they report slightly lower returns. This is probably due to the fact that their sample is from 2005-2006, when the returns are generally lower.

As shown in Table 13, activism that targets the sale of the target firm yields high and significantly positive returns that are robust for different periods. With regard to $CAR_{[-20, 20]}$ and $CAR_{[-50, 50]}$, this type of activism generated returns of 7.68% and 8.66%, respectively. Therefore, the results suggest that this type of activism does create shareholder value, a finding that is similar to Brav et al. (2006) A similar pattern of abnormal returns arise when looking at corporate governance and strategy categories. The returns generated by the corporate governance related activism for periods of 41 and 101 days around the 13D filing date are 6.99% and 8.40%, respectively. Brav et al. (2006) do not find positive abnormal returns for corporate governance related activism. This can be explained with the fact that about 50% of the corporate governance related activism takes place in 2000-2004, and therefore are not included in their sample. Activism aimed at improving target firm's strategy yields abnormal returns of similar magnitude, but the returns are insignificantly different from zero except for the 41-day period after the 13D filing. The returns for the 41 and 101-day periods are 5.88% and 9.05%, respectively. Similarly, the activism with no specific demands generates significantly positive returns of 6.61% and 7.74% for event windows [-20, 20] and [-50, 50], respectively. Moreover, when activist hedge funds are willing to extend financing to target firms, the abnormal returns are quite high, but insignificant due to the fact that there are only 2 such events in the sample.

Surprisingly, I find that activism that seeks to change the capital structure of target firms yields negative abnormal returns of -3.85% and -5.90% for the 41 and 101-day periods, suggesting that this type of activism does not increase shareholder value. Closer examination of the data reveals that only the post 13D filing date returns are significantly negative. A plausible explanation may be that once targeted with a capital structure proposal, investors learn about the firm's limited growth opportunities, which offsets the possible effects of distributing excess cash to shareholders.

Figure 4: Cumulative abnormal returns by activism type

The figure plots regression coefficients for OLS regression of cumulative abnormal return during 101-day event window surrounding the 13D filing date for 470 firms that were targeted by activist hedge funds in 2000-2006 using activism type dummies as independent variables. Activism type dummies represent the seven different categories of activist hedge fund demands at target firms: general, corporate governance, demand sale, capital structure, strategy, oppose M&A, and financing. Categories are not mutually exclusive. The constant term is suppressed to zero to obtain coefficient values that can be interpreted as mean abnormal returns for a particular category. The abnormal return is calculated based on the market model parameters estimated days of -300 to -51 using S&P500 as the market proxy. Y-axis is the coefficient in the OLS regression that can be interpreted as mean CAR. Activism type dummy variables are on the X-axis.



5.3 Sources of shareholder gains

In previous section I examined the cross-section cumulative abnormal returns associated with 13D filings by activist hedge funds. This section, in turn, investigates CARs in a multivariate setting where numerous firm characteristics are applied to OLS model. I also control for the cross-sectional variation in returns by including dummy variables for targeting year, activism type, and industry in the regression models. It should be noted that neither Brav et al. (2006) nor Klein and Zur (2006) examine returns associated with hedge fund activism in a multivariate setting using firm characteristics as explanatory variables.

Table 14 reports the results of four multivariate regressions where the dependent variables are $CAR_{[-50, 50]}$, $CAR_{[-20, 20]}$, $CAR_{[-2, 2]}$, and the 13D filing date return, respectively. Independent variables are the ones also applied in the logit regressions in Section 5.1.3. However, I exclude the R&D dummy and liquidity as independent variables due to their extremely low significance in the logit and OLS models. I also exclude institutional ownership variable because it limits the number of observations. Furthermore, I add a dummy variable corresponding to type of activism to control for the cross-sectional variation in returns.

Table 14: Multivariate OLS regressions of cumulative abnormal returns

The table reports OLS regression coefficients and corresponding t-statistics (in parentheses under each coefficient) for four OLS regressions models where the dependent variables are cumulative abnormal returns over event windows [-50 ,50], [-20, 20], [-2, 2], and [0, 0], where day 0 is the initial 13D filing date. The abnormal return is calculated based on the market model parameters estimated of days -300 to -51 using S&P 500 index as market proxy. Independent variable *Net-of-market return* is the one year unadjusted return prior to the 13D filing year less same period return on S&P 500 index; *Free cash flow* is earnings before depreciation and amortisation less tax, interest, dividends and share repurchases divided by total assets; *Cash ratio* is the cash and marketable securities divided by total assets; *Debt ratio* is the total debt divided by total assets; *Sales growth* is the average geometric growth rate in firm's sales for a two year period before the 13D filing year; *Diversification* is the number of business segments for which a firm reports four-digit SIC code; *Industry q* is the median Tobin's *q* of firms in the same Fama-French 48 industry; *Abnormal q* is the percentage difference between Tobin's *q* and industry *q*; *Insider ownership* is the percentage of closely held shares as reported by Thomson Financial; *ln(market capitalisation)*is the natural logarithm of year end market capitalisation; *Activism type dummies* represent the seven different categories of activist hedge fund demands at target firms: general, corporate governance, demand sale, capital structure, strategy, oppose M&A, and financing; *SIC dummies* are dummy variables that represent the ten one-digit SIC codes; *Year dummies* are dummy variables that represent the individual years. All variables are calculated as of the year end before the 13D filing. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at the 1%, 5%, and 10% levels, respectively.

		Dependent variable			
Independent variables	Expected sign	$CAR_{[-50, 50]}$	$CAR_{[-20, 20]}$	$CAR_{[-2, 2]}$	$CAR_{[0, 0]}$
Net-of-market return	-	-0.1797 ***	-0.0867 ***	-0.0282 ***	-0.0071 *
		(-5.12)	(-4.36)	(-4.05)	(-1.64)
Free cash flow	+	0.2648 **	0.1237 *	-0.0467 *	-0.0176
		(2.01)	(1.66)	(-1.79)	(-1.09)
Cash ratio	+	0.2798 **	0.0599	0.0061	-0.0096
		(2.31)	(0.87)	(0.25)	(-0.64)
Debt ratio	-	0.0912	0.0670	-0.0149	-0.0215 **
		(0.87)	(1.12)	(-0.71)	(-1.67)
Sales growth	+	-0.0553	-0.0101	0.0041	0.0198 ***
		(-0.85)	(-0.27)	(0.32)	(2.49)
Diversification	+	0.0030	-0.0087	0.0023	0.0024
		(0.25)	(-1.29)	(0.97)	(1.64)
Industry q	-	-0.0196	-0.0061	-0.0186 **	-0.0062
		(-0.40)	(-0.22)	(-1.89)	(-1.03)
Abnormal q	-	-0.0799 **	0.0102	0.0089	0.0009
		(-1.86)	(0.42)	(1.04)	(0.16)
Insider ownership	-	-0.0023 ***	-0.0011 **	-0.0001	-0.0001
		(-2.39)	(-2.13)	(-0.37)	(-0.62)
ln (market capitalisation)	-	-0.0023	-0.0005	-0.0021	-0.0011
		(0.09)	(-0.07)	(-0.83)	(-0.74)
Constant		-0.0213	0.1158	0.0846 *	0.0001
		(-0.09)	(0.85)	(1.77)	(0.03)
Activism type dummies		yes	yes	yes	yes
SIC dummies		yes	yes	yes	yes
Year dummies		yes	yes	yes	yes
Number of observations		430	430	430	430
F-stat		2.62	2.16	2.81	1.76
(p-value)		(0.000)	(0.001)	(0.000)	(0.009)
R^2		0.1646	0.1399	0.1743	0.1171

First column of Table 14 examines how $CAR_{[-50, 50]}$ correlates with various target firm characteristics. The most prominent result of this regression is the highly significant negative coefficient for net-of-market return, suggesting that shareholders of firms that have performed extremely badly in the previous year gain more from the activist hedge fund intervention. This finding lends strong support for the hypothesis that activist hedge funds can successfully discipline poorly performing firms and improve performance. Moreover, the fact that higher returns come from worst performing firms indicates that changes in such firm are easier to implement and are more likely to increase shareholder value, as suggested by Kahn and Winton (1998).

The regression results in the first column of Table 14 also show a positive and significant relation between CAR $_{[-50, 50]}$ and free cash flow and cash ratio. These results are consistent with the argument of Jensen (1986) stating that value increasing takeovers occur in companies that have substantial free cash flow and are susceptible of agency problems. In the case of hedge fund activism, the positive relation between free cash flow, cash ratio, and returns may be explained by the fact that investors increase their expectation of firm value in anticipation of such value increasing takeovers. Also, the positive CARs associated with hedge fund activism may arise in anticipation of debt creation, which, according to Jensen (1986), helps to prevent nonvalue maximising behaviour on the part of managers. However, the negative returns associated with capital structure proposals contradict the latter argument. Empirically, the results for free cash flow and cash ratio are consistent with the findings of Lehn and Poulsen (1989) examining LBOs and free cash flow theory. They document a positive relation between free cash flow and premiums paid in LBOs. Similarly, the result for cash ratio is consistent with Faleye (2004) who finds that abnormal returns associated with proxy fight are positively related to excess cash holdings. These findings, accompanied by the fact free cash flow is significantly positively related to the probability of targeting, are consistent with the notion that activist hedge funds are able to target firms suffering from severe agency problems and improve their performance by mitigating these problems.

Furthermore, the results presented in Table 14 lend further support for the undervaluation hypothesis as the relation between CAR $_{[-50, 50]}$ and abnormal q is significantly negative at 5% level. This finding suggests that investors regard the 13D filing by an activist hedge fund as a signal of undervaluation and adjust their assessment of target firm value accordingly. Moreover, the significantly negative coefficient for abnormal q indicates that the more the target is undervalued the higher the abnormal return at targeting will be. This result is consistent with the findings of Lang et al. (1989) and Servaes (1991) who document a negative relation between Tobin's q and gains from takeovers. The fact that abnormal q predicts the probability of hedge fund activism as well as the associated returns in a statistically significant manner makes a compelling case in support of the undervaluation hypothesis.

Another noteworthy point in Table 14 is the significantly negative between CAR $_{[-50, 50]}$ and insider ownership. This finding lends further support for the free cash flow hypothesis. As argued in Jensen (1986), free cash flow is a problem when agency costs are high. Insider ownership is often used as a proxy for the severity of agency problems. For example, Lehn

and Poulsen (1989) divide their LBO sample into high and low insider ownership subsamples and find that the coefficients for free cash flow are significantly higher in the latter suggesting that smaller the insider ownership, greater the potential for agency costs. Thus, the finding is consistent with the notion that the room for improvement, and potential gains thereof, are higher in firms with greater problems of agency.

The second column of Table 14 reports the OLS regression coefficients of $CAR_{[-20, 20]}$ on the same independent variables as the first column. The results are generally consistent with the first column regression of $CAR_{[-50, 50]}$. Net-of-market return is significantly negatively related to the cumulative abnormal return, but the coefficient is slightly smaller. The coefficient for free cash flow is positive and significant, but also smaller. The relation between cash and cumulative abnormal return is positive, but insignificant. Furthermore, the coefficient for abnormal q looses its significance and the sign changes as well. The relation between insider ownership and $CAR_{[-20, 20]}$ is significant and negative, but only at 5% level compared to 1% significance in the first regression. The decrease in the significance of coefficients can be observed from the F-statistics and explanatory power of the second model, which are both smaller compared to the $CAR_{[-50, 50]}$ regression. Overall, the results from this regression are consistent with disciplinary role of activist hedge funds, the free cash flow hypothesis, and agency problem hypotheses in general, as indicated by the significant coefficients for net-of-market return, free cash flow, and insider ownership.

The third column of Table 14 presents the estimates of OLS regression coefficients for the same independent variable using $CAR_{[-2, 2]}$ as the dependent variable. The results obtained from this regression differ markedly from the two previous models. Net-of-market return is still significantly negatively related to CAR, but the coefficient is distinctly smaller. Free cash flow enters the model with a significantly negative coefficient, which is seemingly inconsistent with the free cash flow hypothesis. Moreover, median q enters the model first time with a significantly negative coefficient. This, however, supports the undervaluation hypothesis, and can be explained by the fact that investors may recognise that the target firm comes from an undervalued industry and adjust their expectations accordingly as they do not have time to thoroughly analyse the firm and spot firm-specific undervaluation. The fact that abnormal q receives a significant coefficient in the first regression, where the cumulative abnormal return period is 101 days, is consistent with this explanation. Generally, the lack of significance compared to the two previous models, may arise because shorter period returns may be driven by some other than fundamental factors. Indeed, a closer look at the activism

type dummy variables reveals that the demand sale and financing dummies enter the model with significant coefficients explaining the increase in explanatory power.

A similar inconsistent pattern arises when the 13D filing date return is regressed on the same independent variables. The effect of net-of-market return endures in this model as well, but the significance level decreases to 10%. Surprisingly, the negative coefficient for debt ratio becomes significant at 5% level, which is consistent with the free cash flow hypothesis. This finding is similar to Haw et al. (1987) who suggest that lower returns for highly levered firms arise from the fact that their unused debt capacity is smaller. Even more surprising is the fact that sales growth enters the model with a positive and significant coefficient. This finding is similar to Lehn and Poulsen (1989). This is extremely puzzling given the highly significant negative coefficient for sales growth in the logit models. Neither I nor Lehn and Poulsen (1989) have an explanation for this seemingly inconsistent result. Overall, the results from this regression specification support the disciplining hypothesis but are largely inconsistent with agency cost and undervaluation hypotheses.

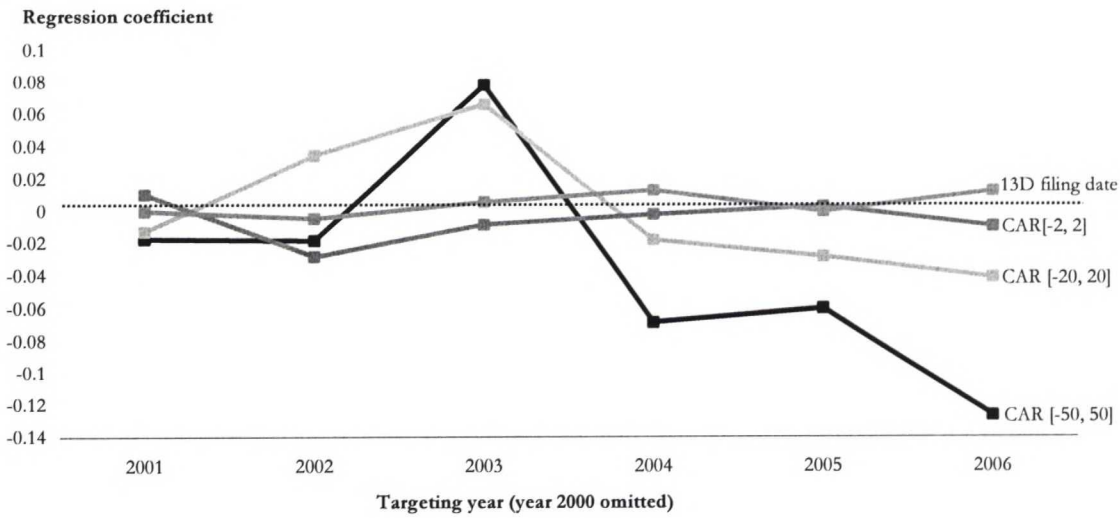
To analyse the effects of targeting year on cumulative abnormal returns in a more robust manner, I examine the coefficients of year dummy variables used in the Table 14 regressions separately. As shown in Section 5.2.2, returns from hedge fund activism have decreased significantly over time. This issue is revisited in Table 15 as it examines the effects of targeting year on CARs in a multivariate setting. Panel A of Table 15 plots the regression coefficients for year dummies of the four regression specifications presented in Table 14. Year 2000 is the omitted variable so the coefficients can be interpreted as a particular year's effect on CARs when compared to that of year 2000. Panel B reports the coefficients as well as t-statistics for the year dummies. Consistent with the univariate analysis, the coefficients for year dummies seem to decline over time in the regressions where $CAR_{[-50, 50]}$ and $CAR_{[-20, 20]}$ are dependent variables. However, all coefficients for year dummies in these regressions have quite low values and are insignificantly different from zero. This result suggests that targeting years themselves do not affect CARs and raises the question whether Bradley et al.'s (1988) diminishing returns hypothesis is accurate in explaining the decline in returns from hedge fund activism. In fact, the results suggest that activist hedge funds have targeted different kind of companies in the early years or that targeted firms with certain characteristics have been especially profitable to activist investors in some years. For example, firms with low Tobin's q may have been more attractive investments in the early

years of the sample, but after the relatively long bull market in share prices in the U.S., the advantages of "value investing" may have diminished.

Table 15: Regression coefficients for year dummies from multivariate OLS regression of CARs

The table plots and reports OLS regression coefficients and corresponding t-statistics for targeting year dummies from four OLS regressions models from Table 14 where the dependent variables are cumulative abnormal returns over event windows [-50 ,50], [-20, 20], [-2, 2], and [0, 0], respectively, where day 0 is the initial 13D filing date. The abnormal return is calculated based on the market model parameters estimated of days -300 to -51 using S&P 500 index as market proxy. *Year dummies* are dummy variables that represent the individual years. All variables are calculated as of the year end before the 13D filing. Year 2000 is the omitted variable. Panel A plots the coefficients. Y-axis is the regression coefficient. X-axis is the year dummy variables. Panel B reports these coefficients and corresponding t-statistics. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A: Plotted coefficients for year dummies from multivariate OLS regressions of CARs



Panel B: Coefficients and t-statistics (in parentheses) for year dummies from multivariate OLS regressions of CARs

	2000	2001	2002	2003	2004	2005	2006
$CAR_{[-50, 50]}$	(dropped)	-0.017	-0.018	0.078	-0.068	-0.060	-0.127
	n/a	(-0.16)	(-0.18)	(0.83)	(-0.77)	(-0.68)	(-1.46)
$CAR_{[-20, 20]}$	(dropped)	-0.013	0.035	0.066	-0.018	-0.028	-0.041
	n/a	(-0.20)	(0.60)	(1.24)	(-0.35)	(-0.57)	(-0.83)
$CAR_{[-2, 2]}$	(dropped)	0.011	-0.028	-0.008	-0.002	0.003	-0.009
	n/a	(0.49)	(-1.40)	(-0.45)	(-0.10)	(0.19)	(-0.54)
13D filing date	(dropped)	0.025*	-0.005	0.006	0.013	0.019*	0.013
	n/a	(1.85)	(-0.36)	(0.52)	(1.20)	(1.73)	(1.21)

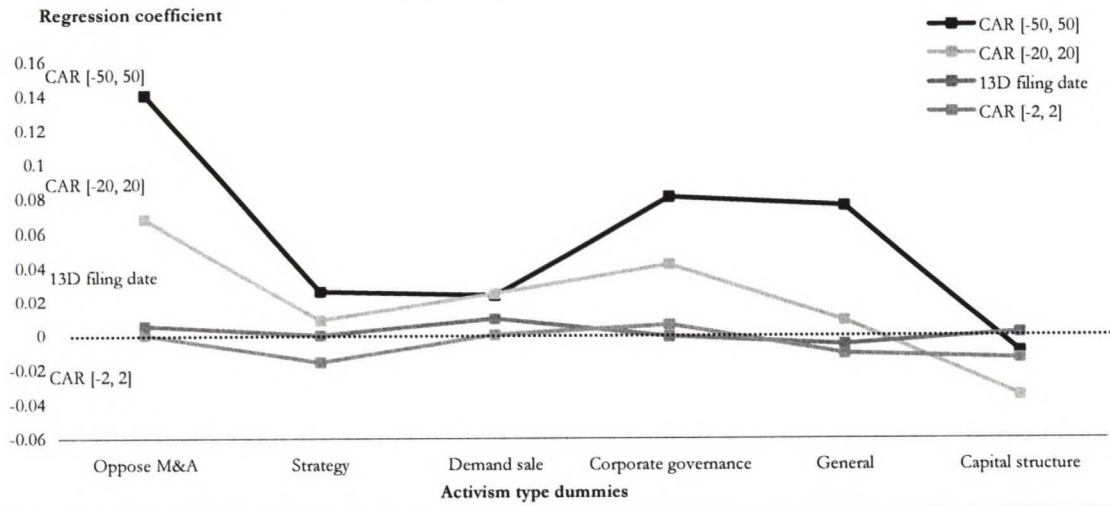
To analyse how activism type affects cumulative abnormal returns in a more robust manner, I also examine the coefficients for activism type dummy variables used in the Table 14 regressions separately. As shown in Section 5.2.3, returns from hedge fund activism show significant cross-sectional variation between different activism types. The analysis presented in Table 16 re-examines this issue and investigates the effects of different activism types on CARs in a multivariate setting. Panel A of Table 16 plots the regression coefficients for activism type dummies of the four regression specifications presented in Table 14. Panel B

reports the coefficients as well as t-statistics for the activism type dummies. Overall, the results from Table 16 indicate that even though activism type appears to have some impact on CARs, the effects are not robust in a multivariate setting as suggested by the fact that nearly all coefficients are insignificantly different from zero. This evidence suggests that activist hedge funds target different kinds of firms with different type of proposals and the unique firm characteristics in each category give arise to the cross-sectional differences in returns. The evidence casts doubt on the univariate results regarding the relations between shareholder gains and types of activism obtained in Brav et al. (2006) and in this thesis.

Table 16: Regressions coefficients for activism type dummies from multivariate OLS regression of CARs

The table plots and reports OLS regression coefficients and corresponding t-statistics for activism type dummies from four OLS regressions models from Table 14 where the dependent variables are cumulative abnormal returns over event windows [-50 ,50], [-20, 20], [-2, 2], and [0, 0], where day 0 is the initial 13D filing date. The abnormal return is calculated based on the market model parameters estimated of days -300 to -51 using S&P 500 index as market proxy. *Activism type dummies* represent the seven different categories of activist hedge fund demands at target firms: general, corporate governance, demand sale, capital structure, strategy, oppose M&A, and financing. However, financing category is excluded from this table as it includes only two activism events. Panel A plots the coefficients. Y-axis is the regression coefficient. X-axis is the activism dummy variables. Panel B reports the coefficients and corresponding t-statistics. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A: Plotted coefficients for activism type dummies from multivariate OLS regressions of CARs



Panel B: Coefficients and t-statistics (in parentheses) for activism type dummies from multivariate OLS regressions of CARs

	Oppose M&A	Strategy	Demand sale	Corporate governance	General	Capital structure
$CAR_{[-50, 50]}$	0.141	0.026	0.024	0.080	0.075	-0.010
	(1.51)	(0.36)	(0.37)	(1.51)	(1.19)	(-0.18)
$CAR_{[-20, 20]}$	0.068	0.009	0.025	0.042	0.009	-0.035
	(1.29)	(0.21)	(0.68)	(1.38)	(0.24)	(-1.16)
$CAR_{[-2, 2]}$	0.000	-0.016	0.044***	0.006	-0.011	-0.014
	(-0.01)	(-1.09)	(3.46)	(0.56)	(-0.89)	(-1.31)
13D filing date	0.005	0.000	0.010	-0.001	-0.006	0.001
	(0.47)	(-0.02)	(1.21)	(-0.17)	(-0.72)	(0.18)

6 Conclusions

In recent years, the market for corporate control in the U.S. has experienced a dramatic increase in hedge fund activism, yet this phenomenon has received virtually no attention in finance literature. Motivated by the increased importance of activist hedge funds in the market for corporate control, this thesis examines i) the determinants of hedge fund activism by comparing 470 activist hedge fund-target firm pairs to 18,696 control firms that were not targeted using multivariate logit specification, ii) shareholder gains from hedge fund activism by calculating cumulative abnormal returns around these activism events, and iii) the sources of gains from hedge fund activism in a multivariate setting using firm characteristics, and targeting year and activism type dummies as independent variables.

This thesis contributes to existing research in numerous ways. First, it provides a more comprehensive picture on the type of firms targeted by activist hedge funds and on the factors that affect targeting likelihood. Most importantly, this thesis extends the work of Brav et al. (2006) and Klein and Zur (2006) as it is the first paper to investigate the effects of undervaluation on targeting likelihood. In addition, this thesis examines the previously unexplored relation between targeting likelihood and variables such as sales growth, firm size, insider and institutional ownership. Third, this is the first paper to examine the cross-sectional variation in returns from hedge fund activism over time covering a period from 2000 to 2006. Fourth, this thesis is the first attempt to examine the relations between CARs and target firm characteristics in a multivariate setting. This analysis sheds additional light on hedge funds motives to engage in activism as well as on the type of firms that are most likely to benefit from hedge fund activism. Finally, compared to concurrent studies, the data used in this thesis cover a longer period of time from 2000 to 2006 and contain about four times as many hedge fund activism events.

The key finding of this thesis is that activist hedge fund targets are significantly undervalued compared to their industry peers and targeting likelihood is increasing significantly in the magnitude of undervaluation. Target firms are also characterised as having high free cash flow, low growth opportunities and low insider ownership when compared to control firms and such firms are also more likely to be targeted. This thesis also shows that hedge fund activism creates shareholder value, but returns have declined significantly in 2000-2006 due to increased competition of fewer attractive targets and to the fact that markets increasingly anticipate hedge fund activism. Finally, the thesis shows that CARs are negatively related to

pre-targeting performance, positively related to free cash flow, and negatively related to insider ownership. CAR is also significantly related to abnormal q supporting the view that markets recognise that activist hedge funds are able to spot undervalued firms. The evidence supports the view that activist hedge funds target undervalued firms and can discipline underperforming and entrenched managers. The remainder of this section discusses these central findings more directly and suggests areas for future research. Summary of key findings is presented in Table 17 at the end of Section 6.1.

6.1 Discussion of central findings

Univariate tests

Univariate tests provide preliminary support for several hypotheses presented in Section 3.1. Most prominent results of the univariate tests relate to firm-specific valuation measures. Decomposing Tobin's q into industry and firm-specific components reveals that abnormal q is both negative and significantly smaller for targets than nontargets. However, I do not find robust differences in industry q between activist hedge fund targets and control firms. This evidence lends support for the undervaluation hypothesis. Brav et al. (2006) do not use similar decomposition but find that targets have significantly lower Tobin's q values than their control firms.

The results also support the inefficient management hypothesis as activist hedge fund targets fare significantly worse than control firms in terms of prior stock price performance. This finding is in contrast to previous evidence which does not find significant differences in share price performance between activist targets and nontargets (Brav et al. 2006, Klein and Zur 2006). Interestingly, univariate tests provide only moderate support for the free cash flow hypothesis since the differences in free cash flow between targets and nontargets are only significant in the mean. However, target firms appear to possess significantly lower growth opportunities when measured with sales growth. This suggests that even though target firms do not appear to retain substantially higher free cash flows, they certainly do so given their future investment opportunities. In comparison to previous studies, Brav et al. (2006) find significantly higher mean and median cash flows for target firms, but no differences in sales growth. Klein and Zur (2006), on the other hand, do not find differences in return on assets between targets and nontargets. These differences may be partially explained with the fact that both Brav et al. (2006) and Klein and Zur (2006) use market/book matched control firms.

I find no differences in cash holdings or debt levels between targets and nontargets, but this may simply be a market/book effect, too. These results are in line with Klein and Zur (2006) who find no differences in cash holdings between targets and market/book matched control firms. In contrast, Brav et al. (2006) find that targets have significantly less cash and higher leverage than control firms. With regard to diversification, targets have more business segments than nontargets, but the differences are only significant in the mean. This finding is in line with Brav et al. (2006) who show that targets are more diversified than control firms when measured with the Herfindahl-index. I also show that that target firms have somewhat lower insider ownership and significantly higher institutional ownership than nontargets. Targets also appear to be of smaller size when measured with market capitalisation. Neither Brav et al. (2006) nor Klein and Zur (2006) examine how insider ownership differs between activist hedge fund targets and control firms, but in line with my results, Brav et al. (2006) show that targets have significantly higher institutional ownership. Brav et al. (2006) also show that targets are significantly smaller in size.

Logistic regressions

The most important contribution of this thesis relates to the undervaluation hypothesis. To date, there is no research on the relation between undervaluation and the probability of hedge fund activism. For example, although Klein and Zur (2006) analyse the determinants of hedge fund activism, their control group does not allow them to examine the effects of Tobin's q on targeting probability. Brav et al. (2006) only perform univariate tests in order to examine how the characteristics of activist hedge fund targets differ from other firms and find that targets have lower Tobin's q values, but do not examine how it affects the targeting likelihood. In addition, this thesis uses a novel approach introduced by Ang and Chen (2006) and decomposes Tobin's q into firm-specific and industry-specific components, which mitigates the problems arising from alternative interpretations for Tobin's q and removes the effects that are time period or industry-specific.

The main finding of this thesis is that undervalued firms (when measured with abnormal q, the firm-specific component) are significantly more likely to be targeted by activist hedge funds suggesting that an important motive for hedge funds to engage in activism appears to be target undervaluation. This result is robust to different model specifications, different sets of control firms, and also holds in the case where logistics regressions are performed for different subsamples based on activism type. With regard to industry-specific measure, the

results indicate that firms that come from industries with low Tobin's q values are significantly more likely to be targeted by activist hedge funds. Together these results suggest that activist hedge fund look for companies from undervalued or underperforming industries and that are severely undervalued compared to industry peers. These results are consistent with empirical evidence from takeovers that low Tobin's q and firm-specific misvaluation increase targeting likelihood (see, e.g. Ang and Chen 2006, Rhodes-Kropf et al. 2005, Hasbrouck 1985, Servaes 1991).

The logistic regression also show that activist hedge funds are more likely to target firms with substantial free cash flow suggesting that activist hedge fund are motivated by the possibility to reduce agency problems and thus create shareholder value. This result is robust to different model specifications, variable specifications, and control groups. This result is also in line with Klein and Zur (2006) who show that targeting probability is positively related to return on assets and with Jensen's (1986) free cash flow theory. Furthermore, the fact that sales growth is significantly negatively related to targeting probability provides corroborating evidence in support of the free cash flow hypothesis. These results compare to Lehn and Poulsen (1989) and Opler and Titman (1993) indicating that, at least to some extent, activist hedge funds have similar motives than private equity firms contemplating LBOs.

I also present new evidence supporting the hypothesis that entrenched insiders deter hedge fund activism since high insider ownership is associated with low targeting probability. Neither Brav et al. (2006) nor Klein and Zur (2006) examine how insider ownership affects targeting likelihood, but the results are largely consistent with the literature covering takeovers (McConnel and Servaes 1990), proxy fights (Dann and DeAngelo 1988), and activist block purchases (Bethel et al. 1998). An alternative argument would be that firms with high insider ownership are better run and thus less likely to experience hedge fund activism.

The results of logit regressions are largely inconsistent with the inefficient management hypothesis since the coefficients for net-of-market return are consistently insignificantly different from zero after controlling for Tobin's q. This indicates that pre-targeting performance does not robustly affect targeting likelihood, which is surprising since targets significantly underperform control firms in the year before targeting. However, this result is in line with Karpoff et al. (1996) who show that even though firms receiving shareholder proposals underperform the market, pre-targeting performance does not affect targeting

likelihood. Faleye (2004) examines the determinants of proxy fight in 1989-2000 and reports similar results. It may be that the target firm underperformance is correlated with some other factors that are more decisive in predicting hedge fund activism.

In addition, I document a positive relation between institutional shareholdings and targeting probability, which is consistent with the hypothesis that large shareholders mitigate the free-rider problem (Shleifer and Vishny 1986). Finally, I show that high market capitalisation deters activist hedge funds, which is consistent with the wealth constraints and idiosyncratic risk hypotheses that suggest that activist hedge funds are less likely to target large companies because accumulating at least a 5% stake in such firms requires too much capital and introduces too much idiosyncratic risk on their portfolios.

Cumulative abnormal returns

I find strong support for the hypothesis that hedge fund activism creates shareholder value. Target firm shareholders gain on average 9.23% during a 101-day event window. The finding that over 60% of targets experience positive CARs lends further support for the hypothesis that hedge fund activism is value increasing. When a [-20, 20] window is used, the total CAR is 8.10% and the fraction of firms that earn positive returns is 65%. These results are somewhat higher than those obtained by Brav et al. (2006) who report CAR of 6.8% during an event windows of [-20, 20] days. Klein and Zur (2006) show that targets earn a return of 10.3% during a [-30, 30] day event window, but they use raw returns, which naturally makes their estimates higher. The higher returns documented in this thesis arise due to the fact that I use data from a longer period of time and the returns in earlier years are higher.

This thesis extends existing literature by documenting cross-sectional differences in returns from hedge fund activism over time. The data show a significant decline in returns between 2000 and 2006: CARs over the 101-day event window are statistically significantly higher in 2000 (19.27%), 2001 (24.25%), and 2003 (22.83%) than in 2002 (5.80%), 2004 (4.33%), 2005 (7.84%), and 2006 (2.59%). Furthermore, the CARs in 2004 and 2006 are insignificantly different from zero. The pattern of returns over the longer event window can be explained by Bradley et al.'s (1988) diminishing returns hypothesis where the increase in the number of targeted firms and competing activist hedge funds drive down returns. The results are also consistent with the hypothesis that investors increasingly anticipate hedge fund activism. The returns on the 13D filing date are in turn higher and significantly positive in 2003 (3.04%), 2005 (1.48%), and 2006 (0.94%) while in 2000, 2001, 2002, and 2004 the

returns are insignificantly different from zero. The pattern of returns on the 13D filing date is consistent with the hypothesis that hedge fund activism has attracted an increasing amount of attention from the financial press and investors making the share prices reflect expected wealth effects more promptly.

The cross-sectional analysis of cumulative abnormal returns also reveals that there are significant differences in returns that could have been made by buying shares in firms subject to 13D filings by activist hedge funds at the end of the 13D filing date. The post-announcement returns over the [1, 50] day window are statistically significantly lower in 2004-2006 compared to 2000-2003. While this strategy has yielded significantly positive abnormal returns in 2000 (13.30%), 2001 (11.68%), 2003 (9.66%), the returns in 2002 (3.13%), 2004 (0.84%), 2005 (0.94%), and 2006 (-0.68%) are insignificantly different from zero. This indicates that investors tracking activist hedge fund purchases have been able to make abnormal gains in 2000, 2001, and 2003 but realised no profits in 2002, 2004, 2005, and 2006.

The data also show that although hedge fund activism is generally associated with increases in shareholder value, this finding does not hold for all types of activism. I show that activism generating significantly positive returns includes events where activist hedge funds demand sale of the target firm (mean cumulative abnormal return associated with this type of activism during a 101-day period around the 13D filing date is 8.66%), propose changes in corporate governance (8.40%), recommend improvements in strategy (9.05%), and generally try to increase shareholder value (7.74%). The evidence with regard to events where activist hedge funds oppose pending M&A deals (10.26%) is less clear and suffers from the fact that the longer event periods might include the pending M&A deal announcement and corresponding returns. Similarly, returns associated with events where hedge funds are willing to provide financing to target firms (36.93%) are not robust as the number of such cases in the sample is only two. Finally, I show that activism related to changing the target firm's capital structure (-5.90%) is associated with negative abnormal returns. These findings are comparable to Brav et al. (2006) who also study the cross-section of abnormal returns between different activism types in 2005-2006 with the exception that they do not find significantly positive returns in the case of corporate governance related activism. Furthermore, in Brav et al.'s (2006) paper, CARs associated with capital structure targeting are not negative but insignificantly different from zero. However, as I show, these results do not persist in a multivariate setting.

Sources of shareholder gains

This thesis is also the first paper to examine the sources of gains from hedge fund activism by examining the relations between CARs and target firm characteristics. The findings from the OLS regressions of cumulative abnormal returns on firm characteristics support the results obtained from multivariate logit analysis. After controlling for cross-sectional variation in returns over time and between activism types, I find that CAR is negatively related to abnormal q supporting the view that markets recognise that activist hedge funds are able to spot undervalued firms. However, the coefficient for abnormal q looses its significance when shorter than 101-day holding periods are used, but the coefficient for industry q turns negative instead, suggesting that the market focuses on industry valuation levels rather than firm-specific valuation close to the 13D filing date. This result is consistent with Lang et al. (1989) and Servaes (1991) who document a negative relation between Tobin's q and gains from takeovers.

CAR is negatively related to pre-targeting performance. This result is robust to different holding period returns around the 13D filing date. This evidence supports the view that activist hedge funds can discipline underperforming managers. CARs are positively related to free cash flow and cash. This evidence is in line with Lehn and Poulsen (1989) who find that LBO premium is positively related to free cash flow and Faleye (2004) who shows that CARs associated with proxy fights are positively related to excess cash. However, the results are somewhat inconsistent when returns are calculated over different holding periods. CAR is also negatively related to insider ownership suggesting that insiders deter changes, as well as manage their firms better as suggested by Dann and DeAngelo (1988), Stulz (1988), and Denis (1990).

This thesis also examines the effects of targeting year and activism type on cumulative abnormal returns in multivariate setting. After controlling for firm characteristics, returns from hedge fund activism show a declining trend from 2000 to 2006, but the results are generally insignificant. More importantly, the cross-sectional differences in returns from hedge fund activism between activism types all but disappear in multivariate OLS regressions, although there seems to be a weak relation between CARs and some types of activism. The evidence casts doubt on the univariate results regarding the relations between shareholder gains and types of activism obtained in Brav et al. (2006) and in this thesis.

Table 17: Summary of findings on determinants of hedge fund activism and sources of shareholder gains

		Expected signs		Key findings	
Hypothesis	Variable	Targeting probability	Shareholder gains	Logistic regressions: What factors affect targeting likelihood?	OLS regressions: What factors affect shareholder gains?
H1	Net-of-market return	Negative	Negative	Weak support. Sign as expected but no significant effects on targeting probability after controlling for Tobin's q.	Strong evidence as poorly performing firms experience significantly higher CARs on all holding periods from 101 to 0 days.
H2	Free cash flow	Positive	Positive	Strong evidence. Firms with high free cash flow significantly more likely to be targeted by activist hedge funds.	Moderate support. 101 and 41-day CARs significantly positively related to free cash flow.
H3	Sales growth	Negative	Negative	Strong support. Low growth firms significantly more likely to be targeted.	Inconsistent results. Generally no significant relation between CARs, but positively related to 13D filing date return.
H4	Cash ratio	Positive	Positive	Weak support. Sign as expected but significant effects on targeting probability only in some logit specifications and for some subsamples.	Moderate support. Cash holdings significantly positively related only to 101-day event window returns.
H5	Debt ratio	Negative	Negative	No support. Sign as expected but no significant relation between targeting probability.	Mixed results. Inconsistent signs in OLS regressions.
H6	Diversification	Positive	Positive	Very weak evidence. Sign as expected but significant effects on targeting probability only in some logit specifications.	No support. No relation between diversification and CARs. Sign of the coefficient inconsistent across regressions.
H7	Tobin's q, Industry q, Abnormal q	Negative	Negative	Strong evidence. Firms with low Tobin's q, Abnormal q and Industry q significantly more likely to be targeted by activist hedge funds.	Moderate support. 101-day CAR significantly negatively related to abnormal q. 5-day CAR significantly related to industry q.
H8	Insider ownership	Negative	Negative	Strong support. High insider ownership deters activist hedge funds as negative and significant coefficient in all specifications.	Moderate support. 101 and 41-day CARs significantly negatively related to insider ownership.
H9	Institutional ownership	Positive	Positive	Strong support. Institutional ownership significantly positively related to targeting likelihood in all logit specifications.	Support, but results not reported due to low number of observations.
H10	Ln (market capitalisation)	Negative	Negative	Strong support. Activist hedge funds avoid firms with high market capitalisation as negative and significant coefficients in all regressions.	No support. Sign as expected but not market capitalisation not significantly related to CARs.

6.2 Directions for future research

My results also raise important questions for future research. The first potential area for further empirical examination relates to changes that take place in target firms after the 13D filing date. The results of this thesis indicate that the market believes that hedge fund activism is value increasing. Therefore, it would be interesting to examine what changes are undertaken by target firms that would explain the positive abnormal returns associated with hedge fund activism. For example, does the operating performance of target firms improve

after targeting? Do target firms experience increased M&A activity, higher top management turnover, or above average payouts of excess cash to shareholders?

The second important area not examined in this thesis is the long-run performance of activist hedge fund targets. Many critics argue that activist hedge funds are motivated by short-term gains at the expense long-run performance. It would be interesting to examine whether the positive effects of hedge fund activism on target firm value in the short-run can persist in the long-run as well. Moreover, it would be interesting to learn whether there is a correlation between long-run post-targeting performance and the above mentioned post-targeting changes. It is too early in the cycle to examine the long-run performance of target firms as majority of target firms were targeted less than two years ago.

The third area that could prove to be an interesting topic for future research relates to diminishing returns from hedge fund activism. This thesis documents that returns from hedge fund activism have decreased significantly over time. This raises two obvious questions. First, will returns from hedge fund activism decrease even further as the number hedge funds and capital pursuing activist strategies increase? Second, if returns from hedge fund activism decline to a point where it is no longer profitable for hedge funds to engage in activism as suggested by the insignificant returns in 2006, then what will be the volume of such events in the future? It may well be that hedge fund activism proves to be a passing phenomenon.

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